IR No. 70-18

INFORMAL REPORT

U.S. NAVAL OCEANOGRAPHIC OFFICE GEOMAGNETIC SURVEYS

1970

U.S. NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D. C. 20390

94

INFORMAL REPORT

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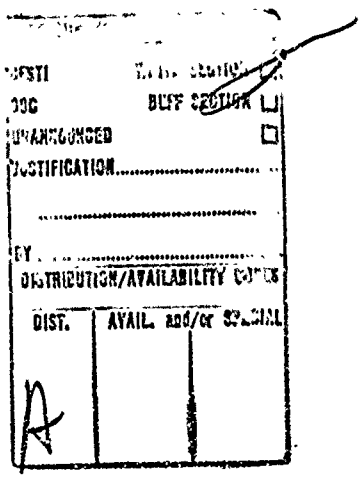

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13 ABSTRACT

Since 1953, the U. S. Naval Oceanographic Office has conducted geomagnetic surveys over various areas of the world. Information on survey locations, dates, navigational control, track patterns, data format, and availability of geomagnetic technical reports, charts, and other publications is presented.

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Geomagnetic Surveys						
Survey Locations						
GEOMAGNETIC DATA						

ABSTRACT

Since 1953, the U. S. Naval Oceanographic Office has conducted geomagnetic surveys over various areas of the world. Information on survey locations, dates, navigational control, track patterns, data format, and availability of geomagnetic technical reports, charts, and other publications is presented.

Magnetics Division

Hydrographic Surveys Department

This report has been reviewed and is approved for release as an UNCLASSIFIED Informal Report.

for H. P. STOCKARD
Director, Magnetics Division

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I. INTRODUCTION

A. General

The U. S. Naval Oceanographic Office has been conducting geomagnetic investigations of ocean areas since the initiation in 1953 of Project MAGNET, a world-wide aeromagnetic survey. This program provides information for computing and charting all elements of the earth's magnetic field. With the introduction of the proton precession magnetometer, total magnetic intensity measurements have been made routinely from steel-hull ships by the Navy since 1957. The information derived from these airborne and shipboard magnetic surveys provides for safe navigation of ships and aircraft, is used for special Naval requirements, and also supports many scientific research programs.

This report presents brief descriptions of geomagnetic surveys accomplished by the U. S. Naval Oceanographic Office and provides information on the format and availability of the data. It also revises and replaces the Geomagnetic Survey Information Report IR 67-52 previously distributed by the U. S. Naval Oceanographic Office.

This report should assist other organizations in their survey planning and research investigations and similar information should be provided to this Office to avoid duplication of effort.

B. Instrumentation

Aeromagnetic component measurements are made with a Naval Ordnance Laboratory Vector Airborne Magnetometer (VAM-2). Total magnetic intensity, inclination, and declination are determined to the following

respective accuracies: ± 15 gammas, ± 0.1 degree, and ± 0.2 degree. To reduce the effects of aircraft motion, angular measurements are averaged over a 100 second time period centered on each 5 minute GMT. The observed data are recorded on continuous analog strip charts. Since 1964, one of the two Project MAGNET survey aircraft has been equipped with a magnetic tape recording system which samples and records the data digitally.

Since 1965 an optical pumping metastable helium magnetometer system has been operated during several special aeromagnetic surveys. This magnetometer system is towed approximately 100 feet behind the survey aircraft and measures only the total magnetic intensity.

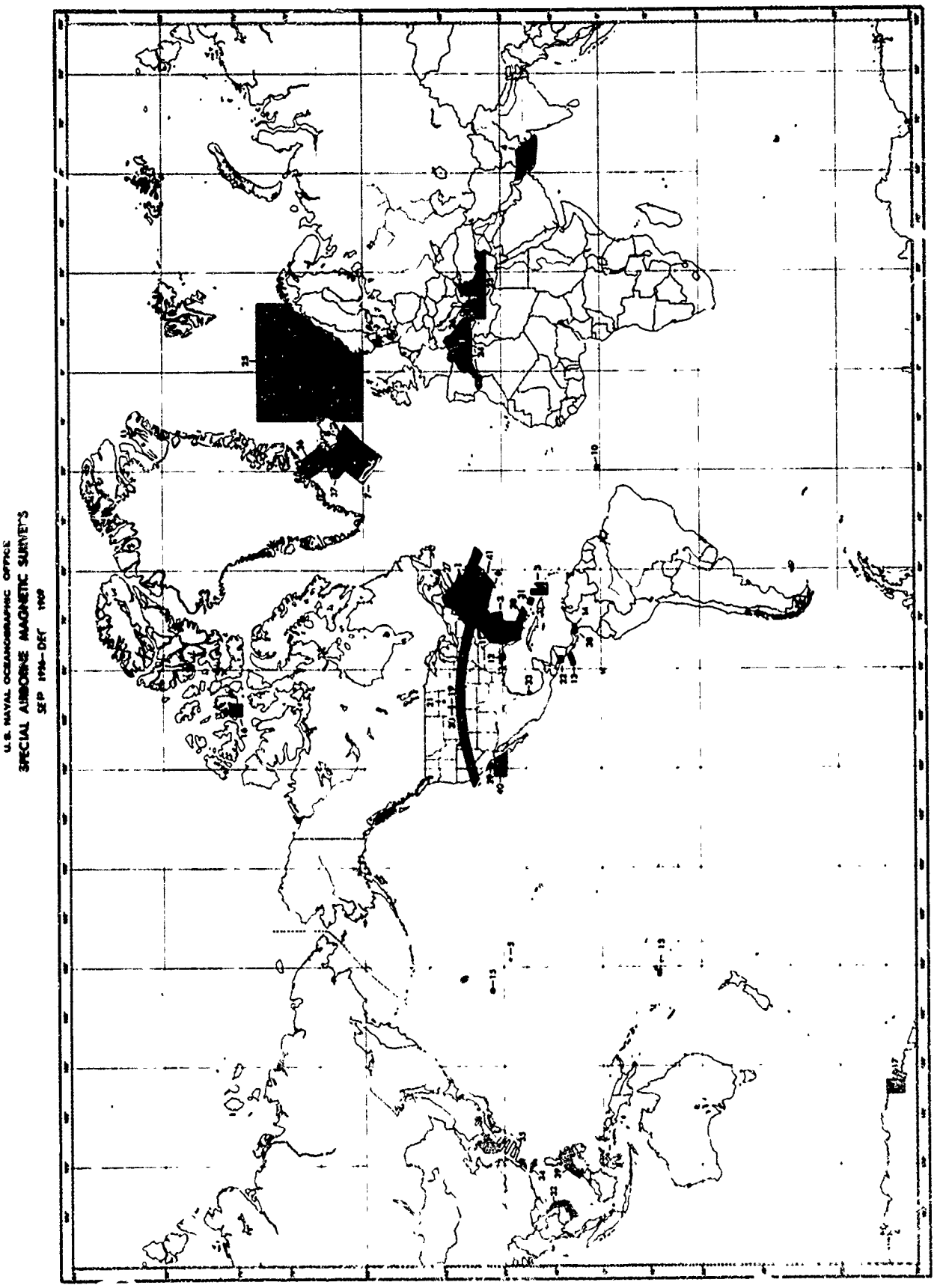
All shipboard magnetic measurements are made with procon precession magnetometers which record total magnetic intensity with an absolute accuracy of ± 1-2 gammas. Measurements are made at 2 to 6 second time intervals and recorded continuously while underway. The sensor unit is towed 500 to 1000 feet astern of the survey ship to minimize the effects of the ship's magnetic field. Data are recorded on analog and digital recorders.

II. GEOMAGNETIC SURVEYS

The U. S. Naval Oceanographic Office has conducted detailed geomagnetic surveys with aircraft in response to specific requirements, or on an opportunity basis aboard ships while they were engaged in some other priority survey mission. These special surveys are usually conducted on a systematic track pattern and often produce sufficient data for the construction of contour charts. Data collected along tracks to and from the survey areas provide profile information in areas where frequently no other geomagnetic data are available.

Survey locations and descriptions are presented on the following pages. Resulting data are available for inspection in this Office as listed under the "Data Format" heading. Charts, profiles, or reports, available for distribution, are listed under the "Products" section of this report (Section III).

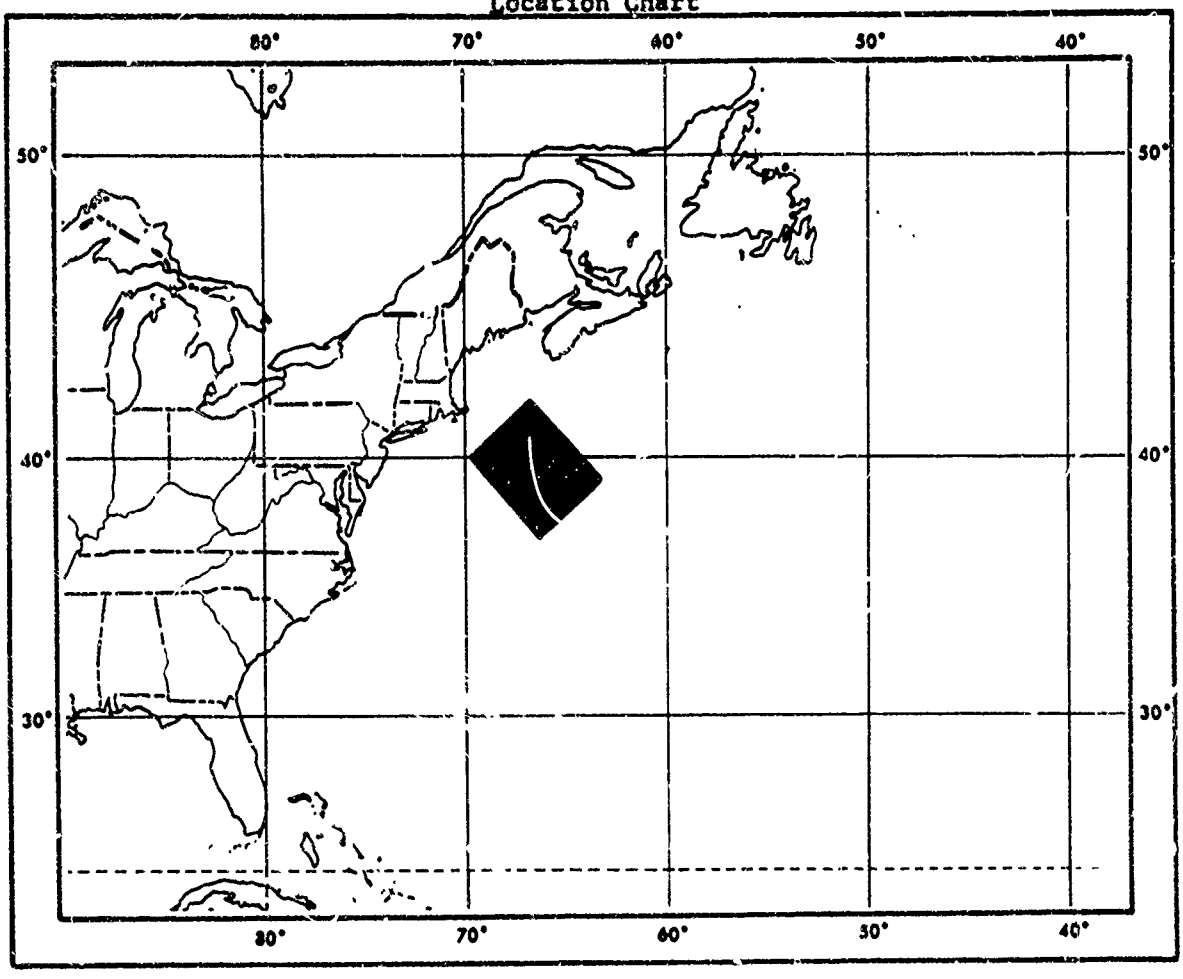
A. AIRBORNE SURVEYS



A. Airborne Surveys

1. New England Seamount Chain Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: May 1957

Navigational Control: Loran-A, Doppler radar

Miles Surveyed: 38,000 square miles

Track Pattern: 5-mile spacing, NW-SE track orientation

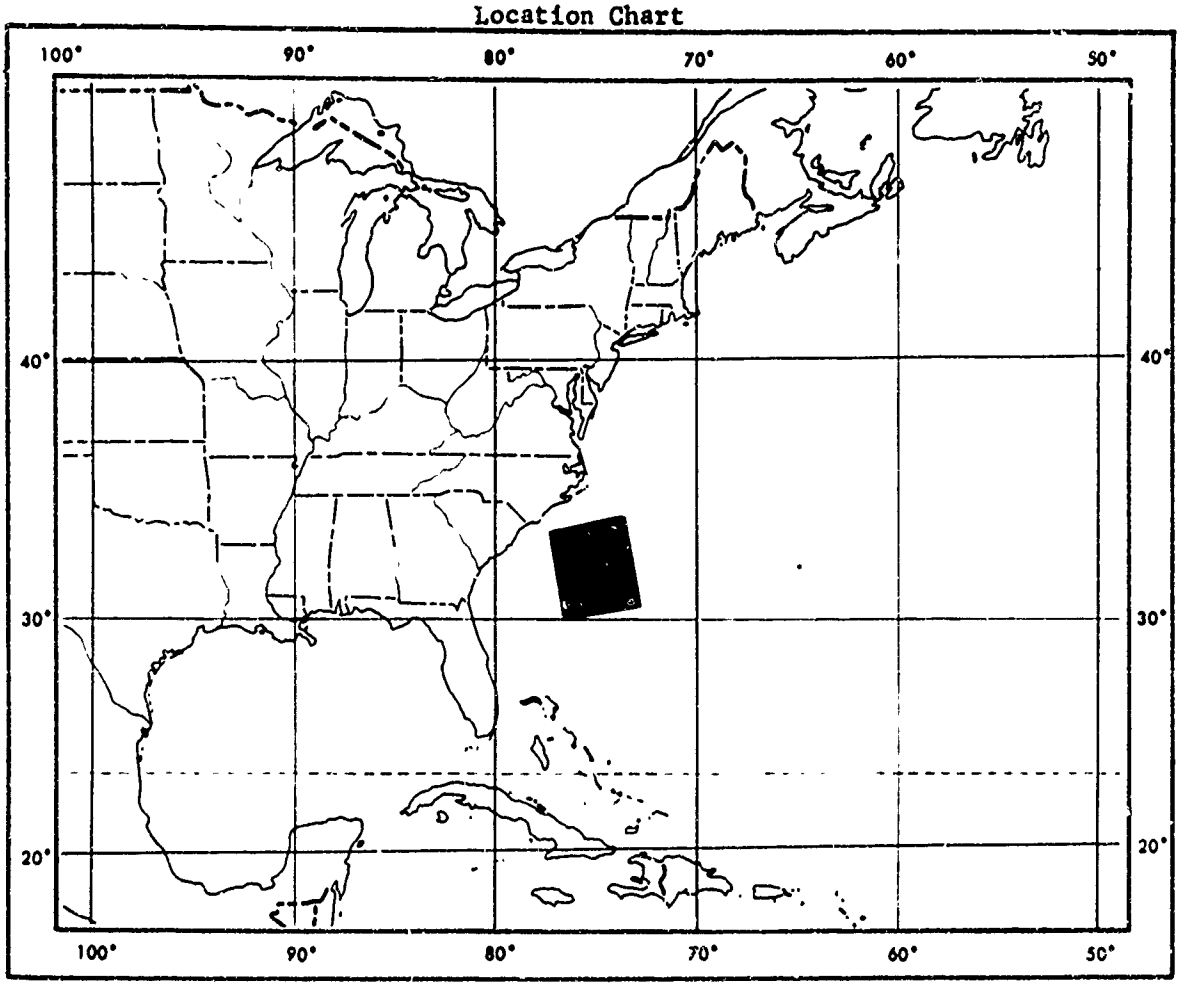
Altitude: 1000 feet

Data Format: Total intensity, horizontal intensity, vertical intensity, and inclination contour charts.

Reports: Technical Report 166, "A Study of Aeromagnetic Data - New England Seamount Area."

2. Blake Ridge Survey (Formerly called Charleston Rise Survey)

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: April 1957

Navigational Control: Loran-A, Doppler radar

Miles Surveyed: 31,000 square miles

Track Pattern: 5-mile spacing, NW-SE track orientation

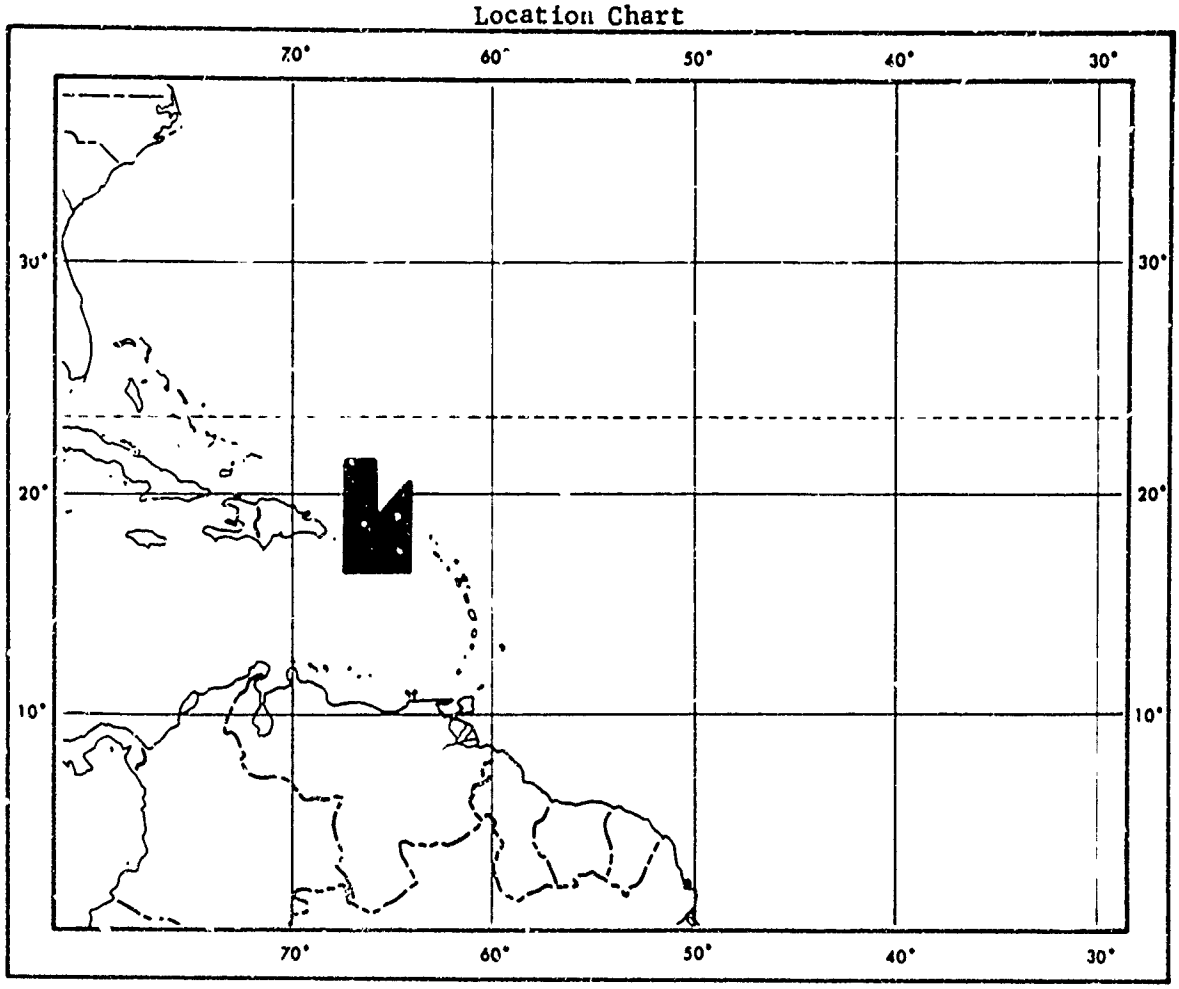
Altitude: 1000 feet

Data Format: Total and residual magnetic intensity contour charts.

Reports: Informal Report No. 67-48, "Blake Ridge Aeromagnetic Survey."

3. Puerto Rico Trench Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date : July 1962

Navigational Control: Loran-A, visual, Doppler radar

Miles Surveyed: 49,000 square miles

Track Pattern: 10-mile spacing, N-S track orientation

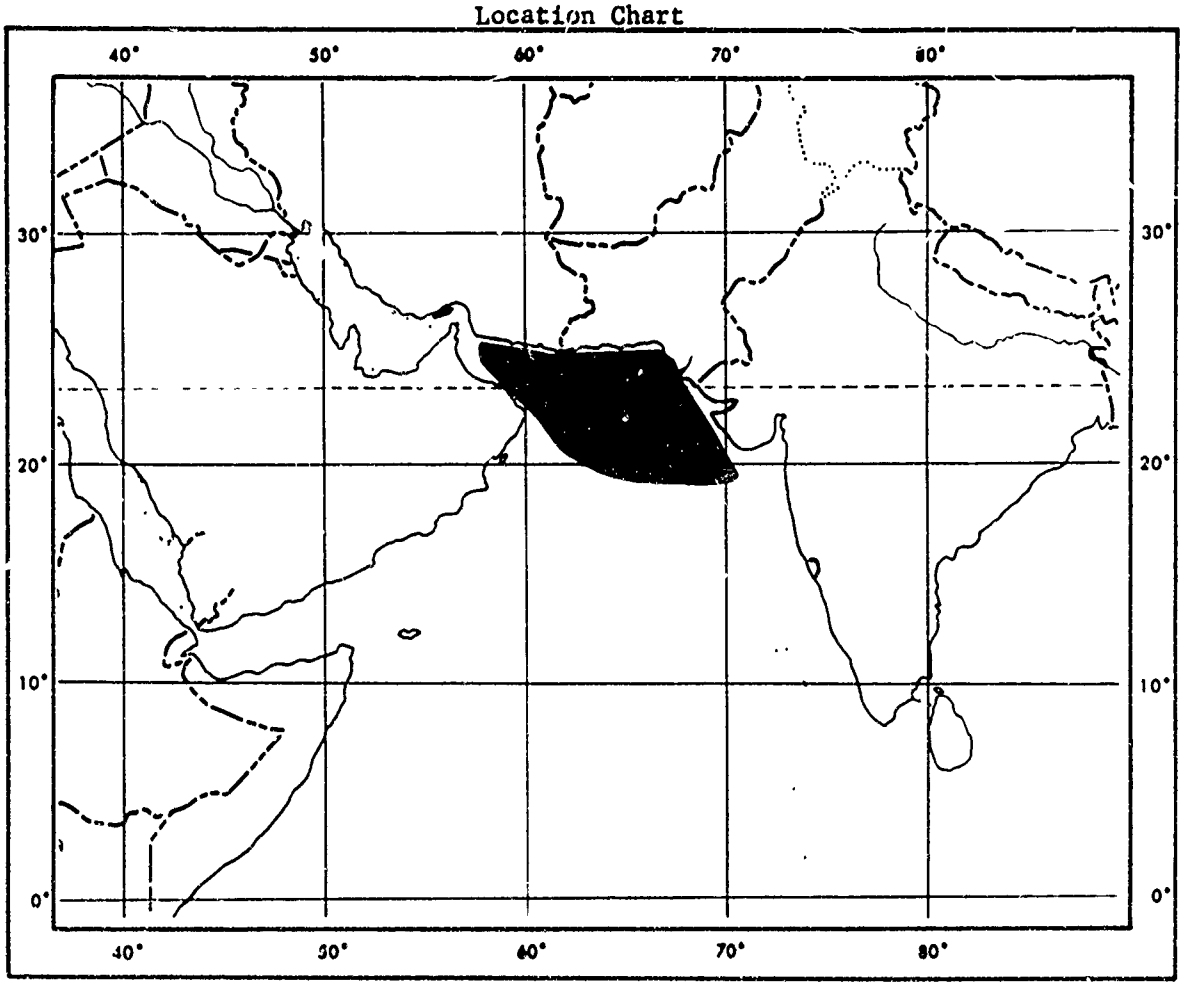
Altitude: 1000 feet over water; 10,000 feet over land

Data Format: Total magnetic intensity contour chart.

Reports: 1) "Island-Arc Structures Interpreted from Aeromagnetic Data near Puerto Rico and the Virgin Islands," Geol. Soc. Am. Bull., V. 77, pp. 153-162, 1966. 2) Informal Manuscript Report No. M-1-63, "Preliminary Report on Special Aeromagnetic Survey Puerto Rico Trench." 3) Informal Report H-1-66, "Magnetic Anomalies North of Puerto Rico: Trend Removal with Orthogonal Polynomials." 4) J. of Geophys. Res., V. 69, No. 24, 1964.

4. North Arabian Sea Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: January 1961

Navigational Control: Dead reckoning and celestial

Miles Surveyed: 130,000 square miles

Track Pattern: Radial pattern south from Karachi, Pakistan; maximum spacing of radials averaged 45 miles

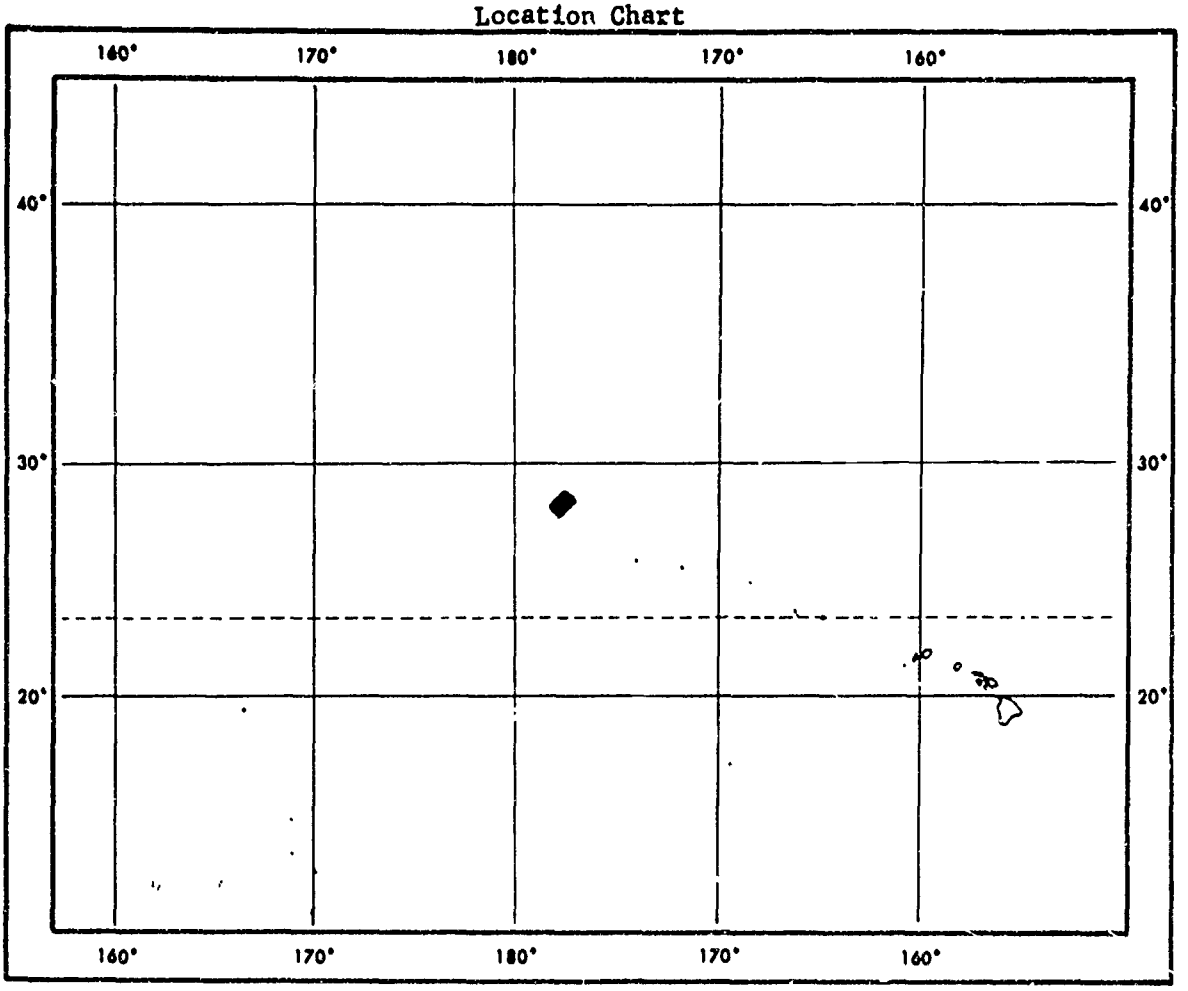
Altitude: 1000 feet

Data Format: Total magnetic intensity contour chart.

Reports: "Interpretation of the North Arabian Sea Aeromagnetic Survey," Earth and Planetary Science Letters, V 4, No. 3, pp. 232-236, 1968.

5. Midway Islands Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date : April 1963

Navigational Control: Visual, Doppler radar

Miles Surveyed: 2400 square miles

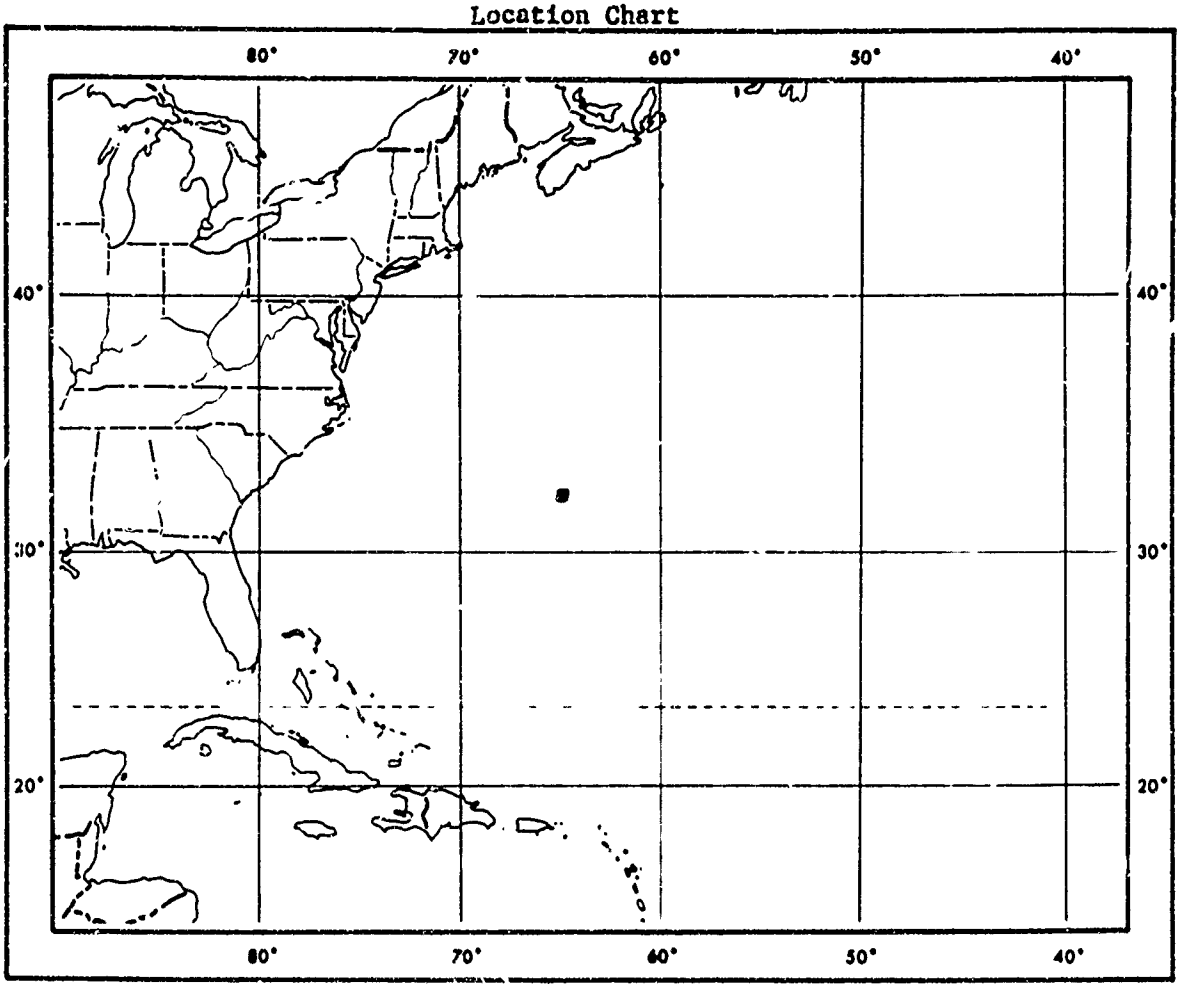
Track Pattern: One-mile spacing, NE-SW track orientation

Altitude: 500 feet

Data Format: Total magnetic intensity contour chart.

6. Plantagenet Bank Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: January 1961

Navigational Control: Loran-C

Miles Surveyed: 52 square miles

Track Pattern: 1/2-mile spacing, E-W track orientation

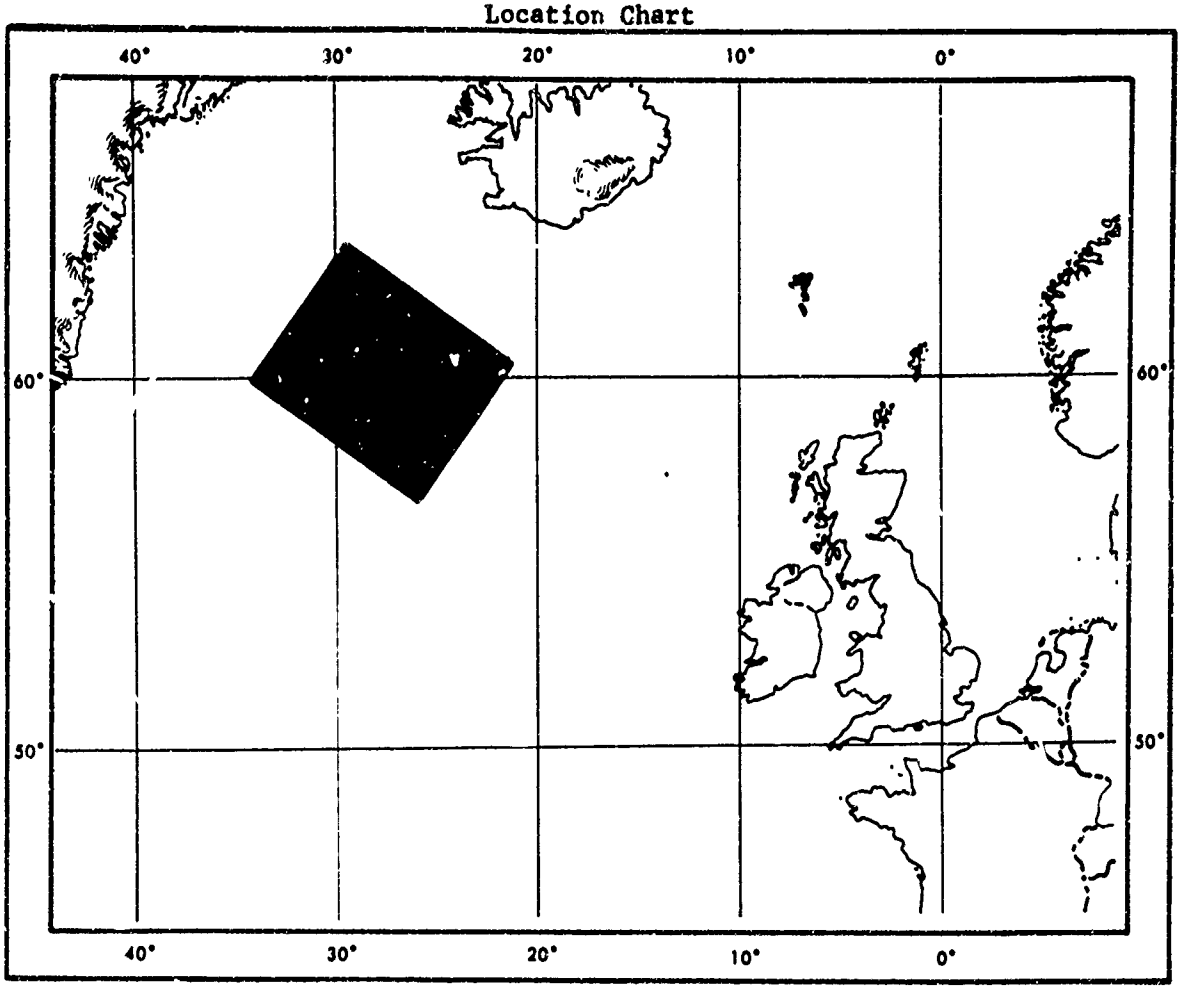
Altitude: 500 feet

Data Format: Contour charts of total magnetic intensity, inclination, declination, anomalous X, Y, and Z components of the earth's field.

Reports: 1) Technical Report 144, "A Study of Aeromagnetic Component Data Plantagenet Bank." 2) "Approximation of Residual Total Magnetic Intensity Anomalies," Geophysics, V. 29, No. 4, pp. 623-627, 1964.

7. Aeromagnetic Survey of Reykjanes Ridge

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: October - November 1963

Navigational Control: Loran-A

Miles Surveyed: 58,000 square miles

Track Pattern: 2-4 nautical mile spacing, tracks flown along Loran-A rates generally orientated NW-SE.

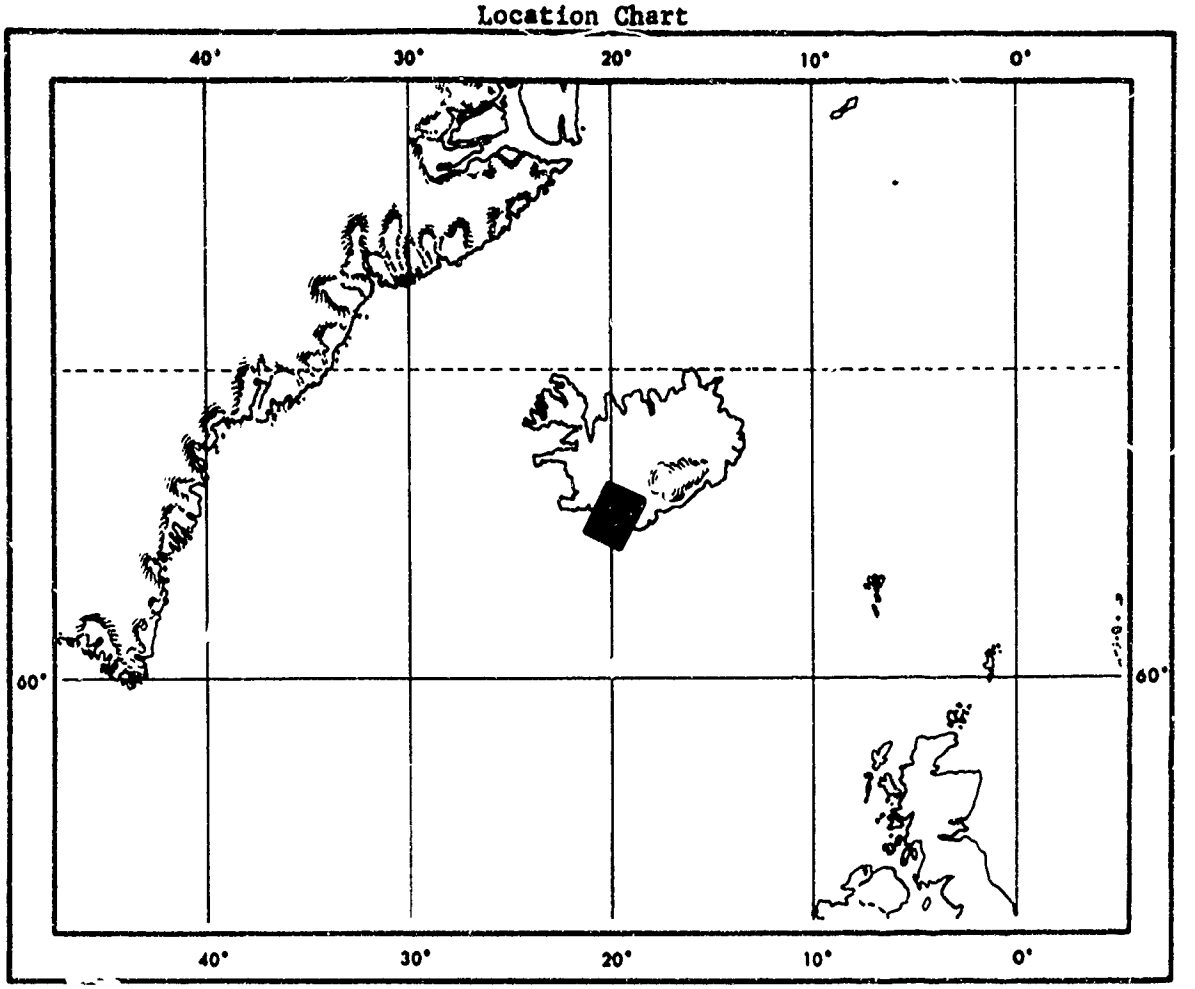
Altitude: 1500 feet

Data Format: Total intensity and residual total intensity charts.

Reports: 1) Informal Report No. H-3-65, "An Airborne Geomagnetic Survey of the Reykjanes Ridge, 1963." 2) "Magnetic Anomalies Over the Reykjanes Ridge," Heirtzler, J. R., Le Pichon X., Baron, J. G., DEEP SEA RESEARCH, V. 13, pp. 427-443, 1966.

8. Aeromagnetic Surveys of Westmann Islands, Iceland (Surtsey)

Location Chart



Aircraft: NC-54R BUNO 90396 and NC-121K BUNO 145925

Survey Dates: November 1963, February 1964 and July 1966

Navigational Control: Visual, aircraft radar

Miles Surveyed: 1100 square miles (Westmann Islands); 3600 square miles (Westmann Islands and South Iceland).

Track Pattern: One-mile spacing at 2000 feet; 2-mile spacing at 6000 feet (1964); NW-SE track orientation at both levels

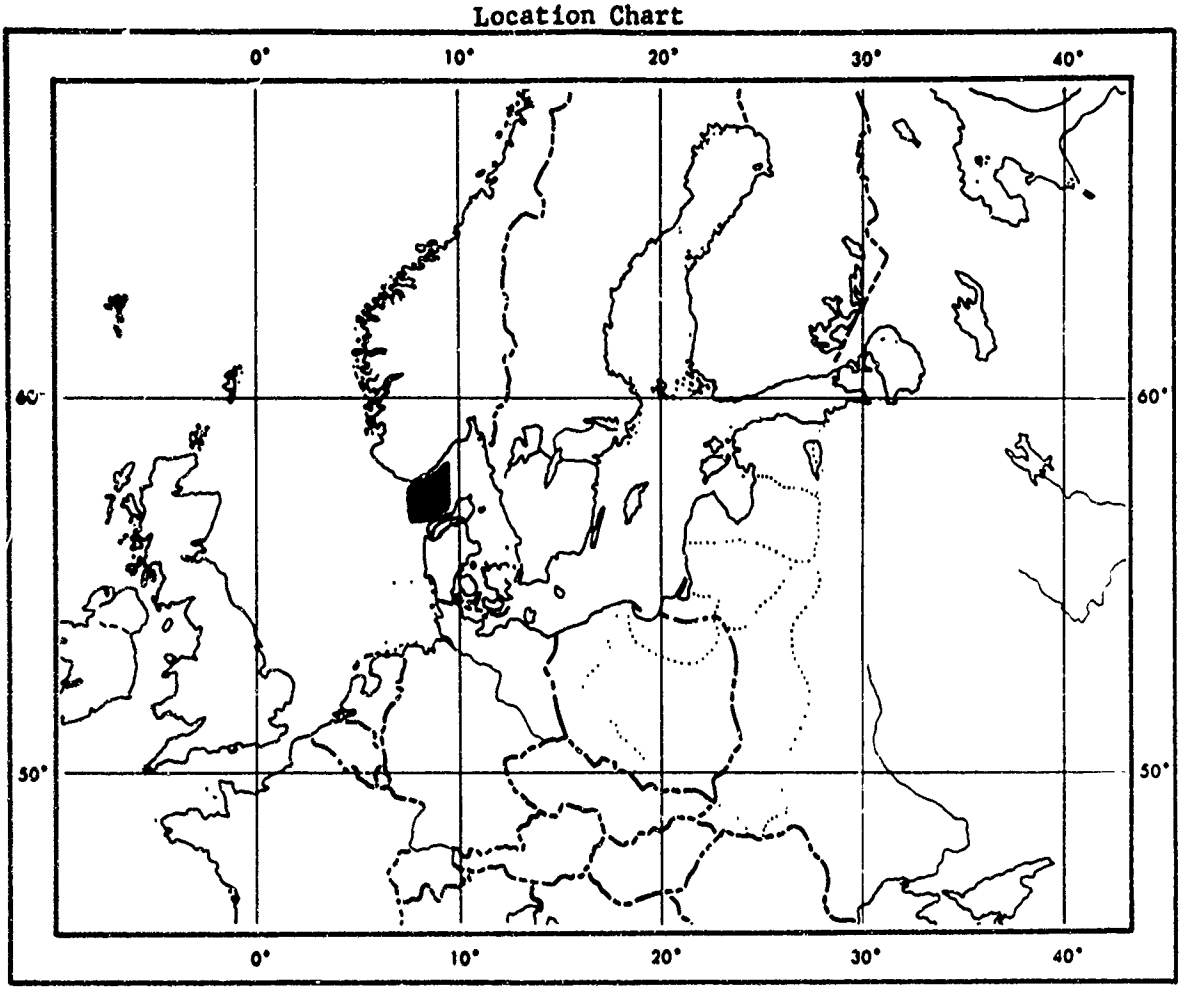
Altitude: 2000 feet (Westmann Islands); 6000 feet (Westmann Islands and South Iceland).

Data Format: Total magnetic intensity contour charts for 1964 and 1966 Westmann Islands survey.

Reports: Technical paper in preparation.

9. Aeromagnetic Survey of the Skagerrak

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: September 1958

Navigational Control: Visual, aircraft radar, and Doppler radar

Miles Surveyed: 5500 square miles

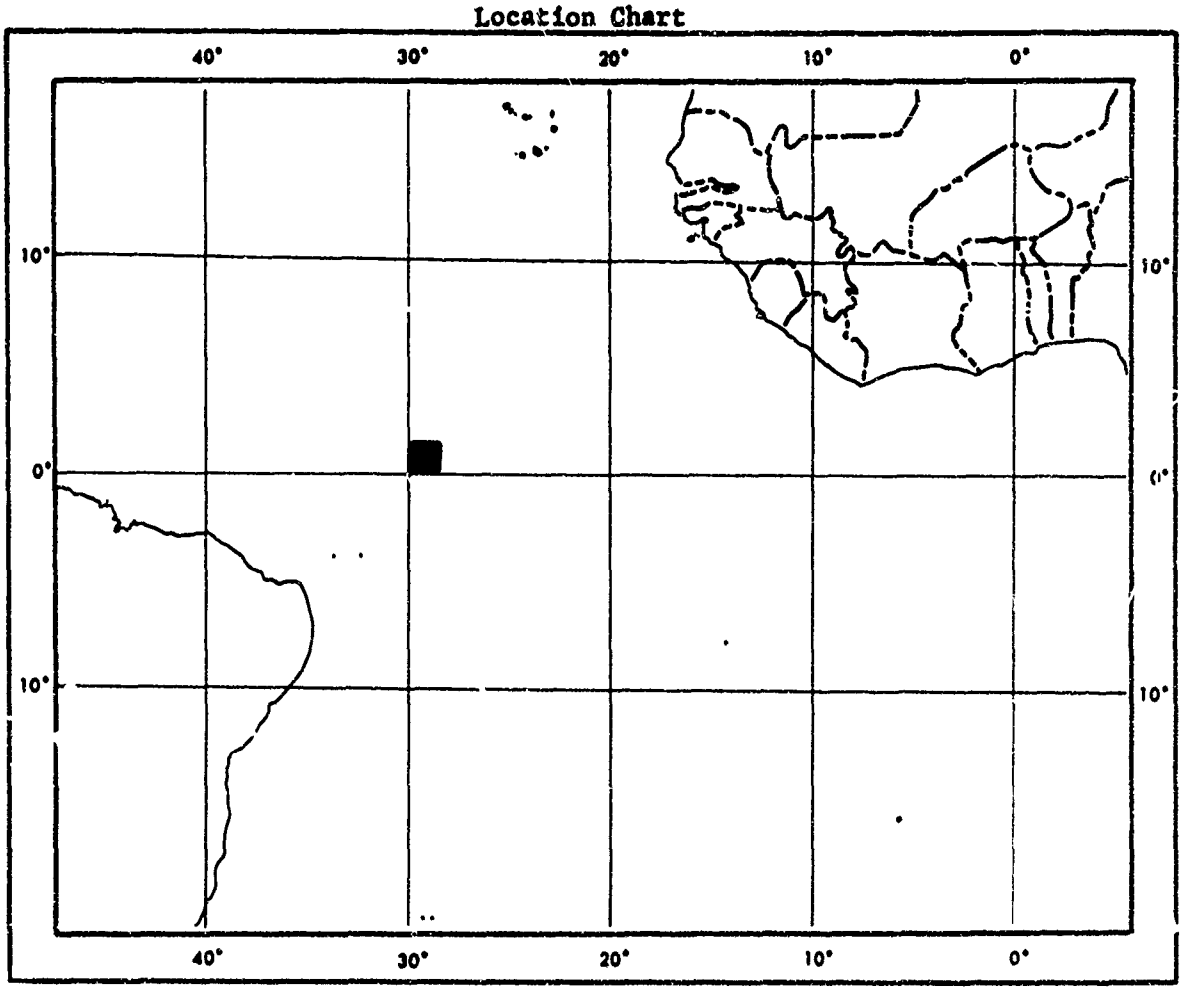
Track Pattern: 10-mile spacing; N-S track orientation

Altitude: 1000 feet

Data Format: Total magnetic intensity contour chart.

10. Aeromagnetic Survey of St. Peter and St. Paul Rocks

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: July 1963

Navigational Control: Aircraft radar and Doppler radar

Miles Surveyed: 3600 square miles

Track Pattern: Radial pattern, maximum spacing of radials averaged 25 miles

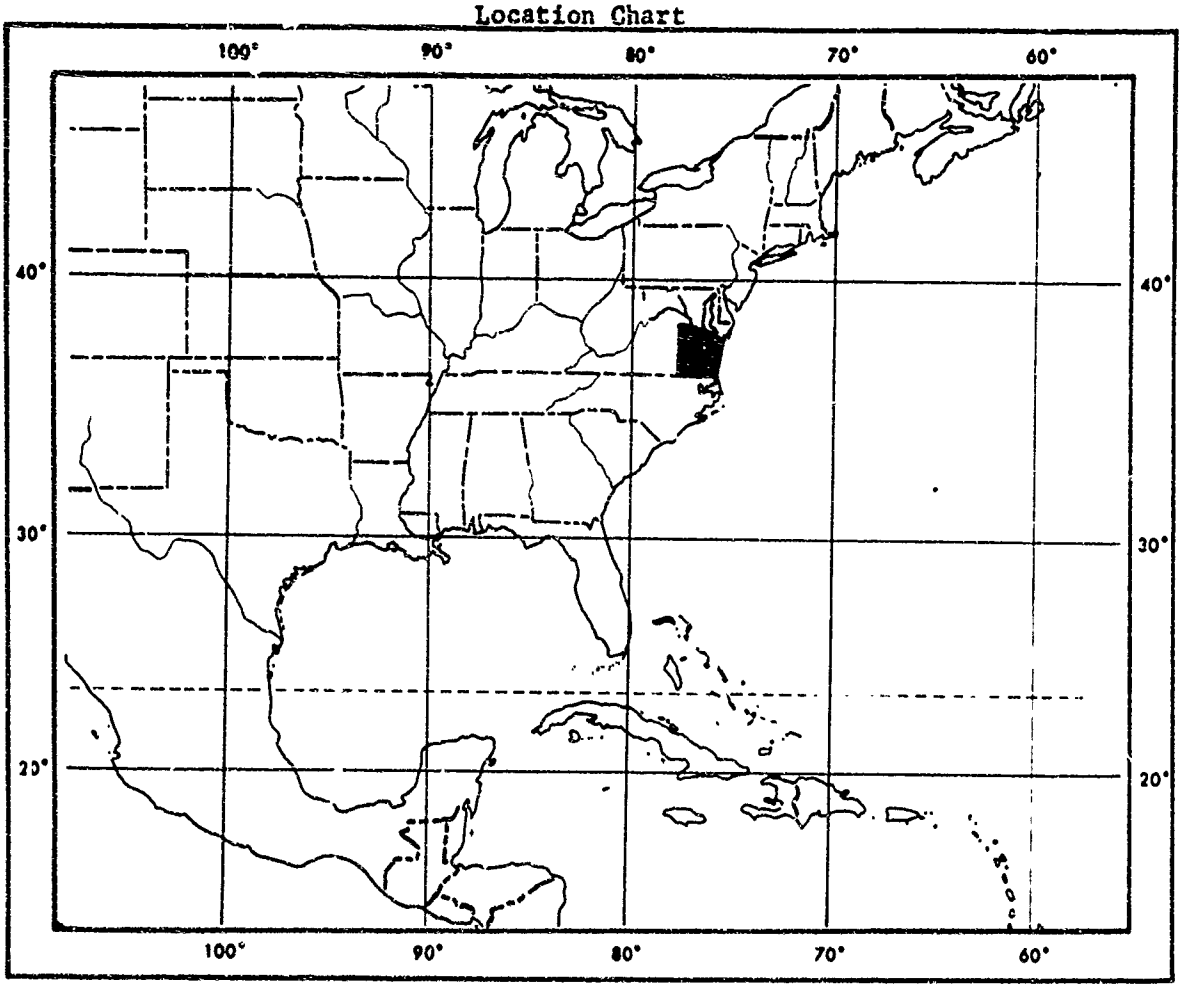
Altitude: 500 and 1000 feet

Data Format: Total magnetic intensity contour chart.

Reports: Technical paper in preparation.

11. Aeromagnetic Survey of Eastern Virginia

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: October 1961

Navigational Control: Visual fixes and Doppler radar

Miles Surveyed: 10,000 square miles

Track Pattern: 15-mile spacing, E-W track orientation

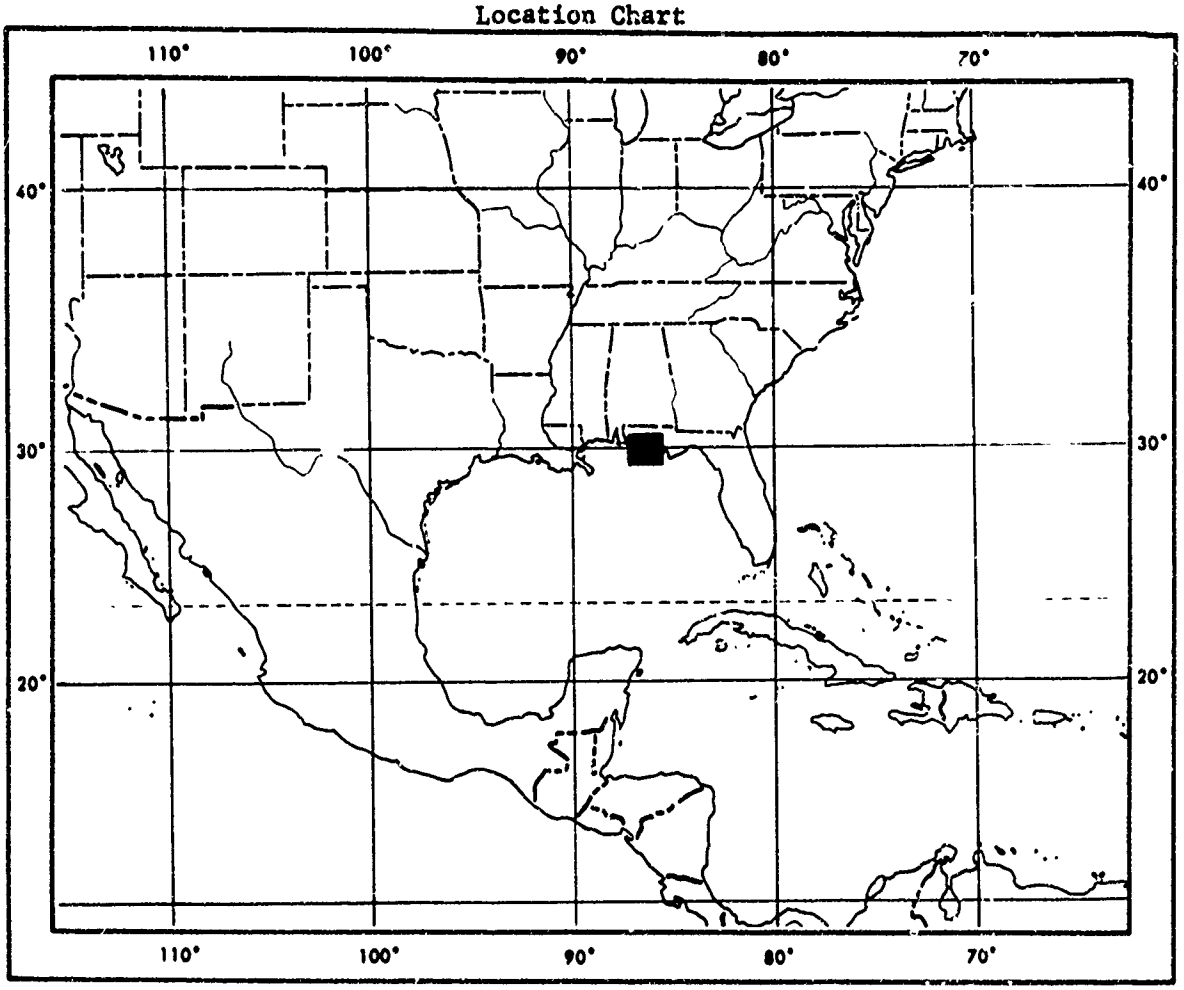
Altitude: 1000 to 3600 feet

Data Format: Total magnetic intensity and second vertical derivative contour charts.

Reports: Informal Report No. M-10-63, "An Interpretation of an Aeromagnetic and Gravity Survey of Eastern Virginia."

12. Aeromagnetic Survey of the Gulf Coastal Area near Pensacola, Fla.

Location Chart



Aircraft: WV-2 BUNO 126513

Survey Date: September 1959

Navigational Control: Ground radar

Miles Surveyed: 3600 square miles

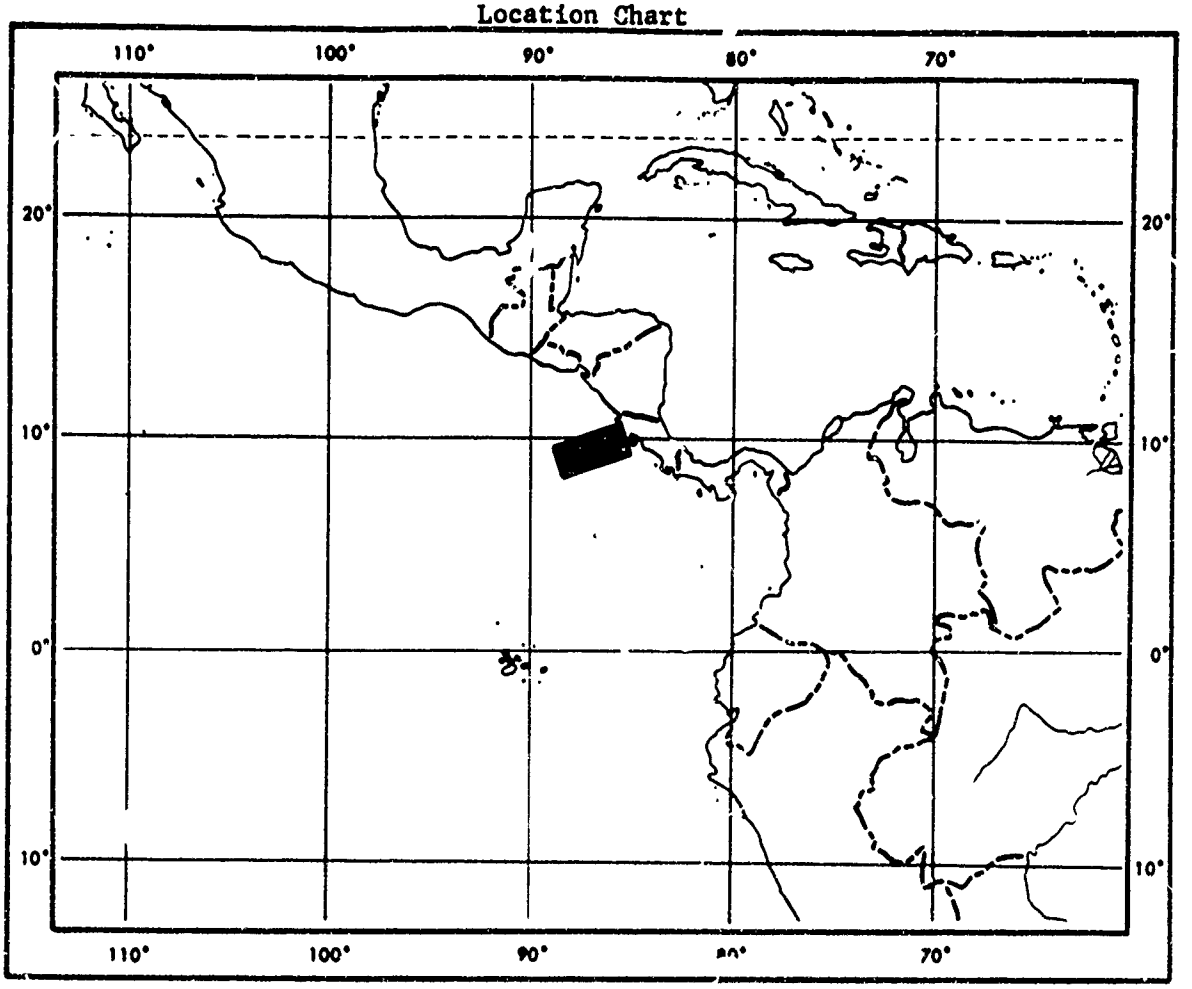
Track Pattern: 2-mile spacing, N-S, E-W track grid.

Altitude: 20,000 feet

Data Format: Total magnetic intensity contour chart.

13. Aeromagnetic Survey of the Guardian Bank

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Date: January 1964

Navigational Control: Aircraft radar and Doppler radar

Miles Surveyed: 13,500 square miles

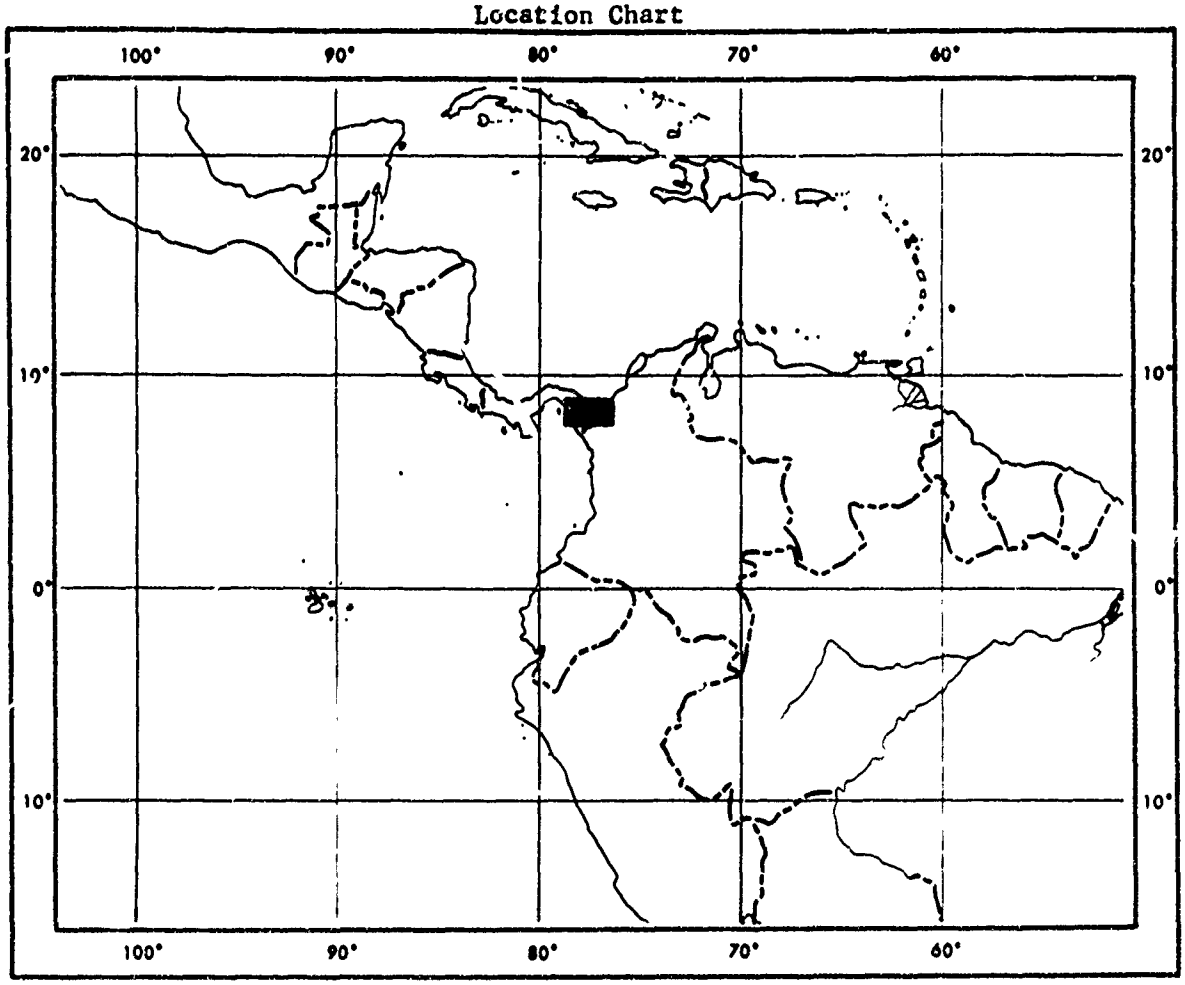
Track Pattern: 10-mile spacing, NE-SW track orientation

Altitude, 1000 feet

Data Format: Total magnetic intensity contour chart.

14. Panama Survey

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Date: April 1963

Navigational Control: Visual

Miles Surveyed: 7500 square miles

Track Pattern: 10-mile spacing, E-W track orientation

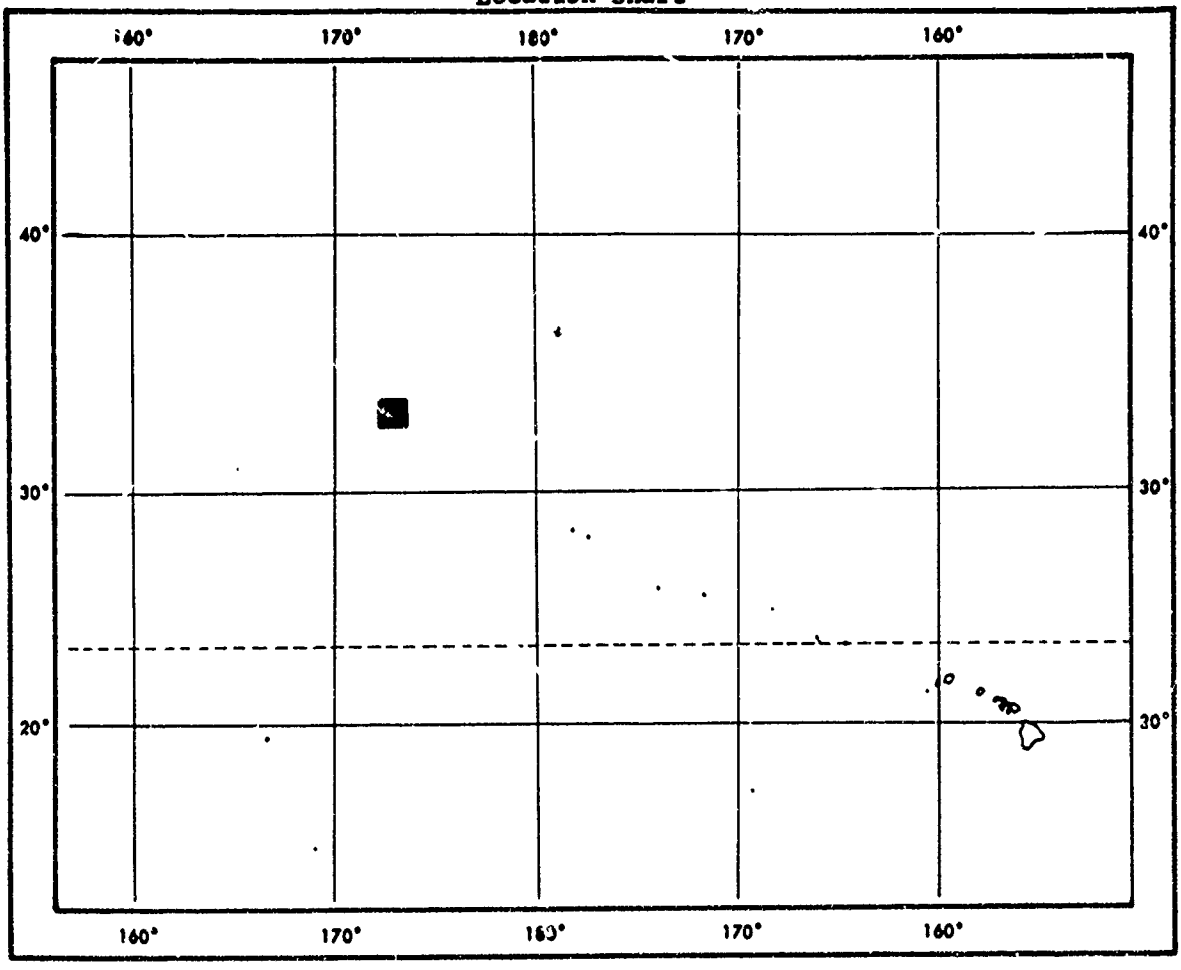
Altitude: 10,000 feet

Data Format: Total magnetic intensity, declination, and inclination contour charts and total magnetic intensity, declination and inclination residual contour charts. Copies of the total magnetic intensity analog trace for the Panama survey are available on microfilm (Track T-115, Reel #4. See Section III-C).

Reports: Informal Report No. IR H-5-65, "An Airborne Geomagnetic Investigation of a Reported Declination Anomaly in Eastern Panama."

15. Milwaukee Bank Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: August 1963

Navigational Control: Doppler radar

Miles Surveyed: 3600 square miles

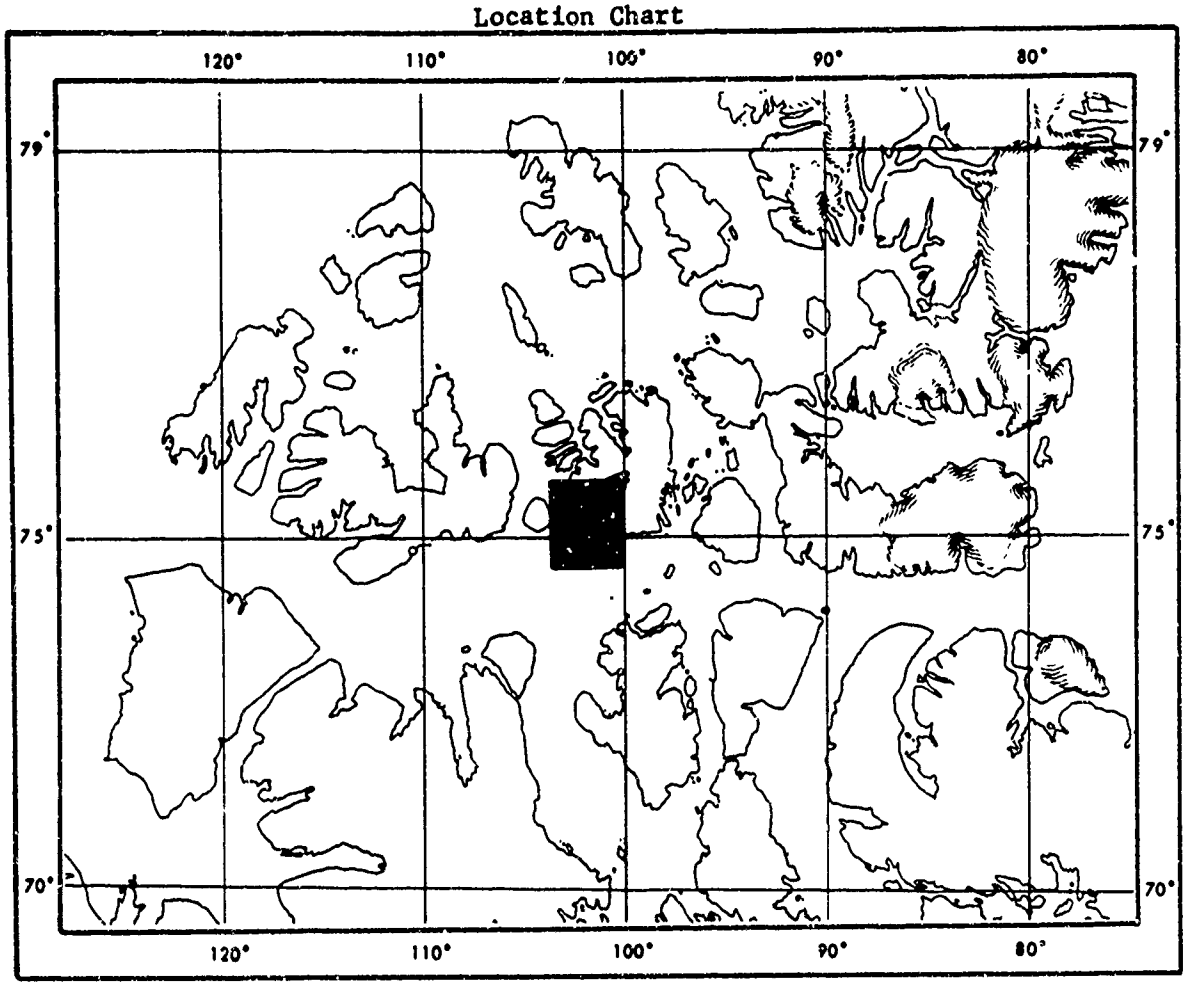
Track Pattern: 10-mile spacing, N-S track orientation

Altitude: 1500 feet

Data Format: Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the Milwaukee Bank Survey are available on microfilm (Track 3.6, Reel #30. See Section III-C).

16. Search for the North Magnetic Pole, 1960

Location Chart



Aircraft: WV-2 BUNO 126513

Survey Date : 2 September 1960

Navigational Control: Aircraft radar

Miles Surveyed: 8000 square miles

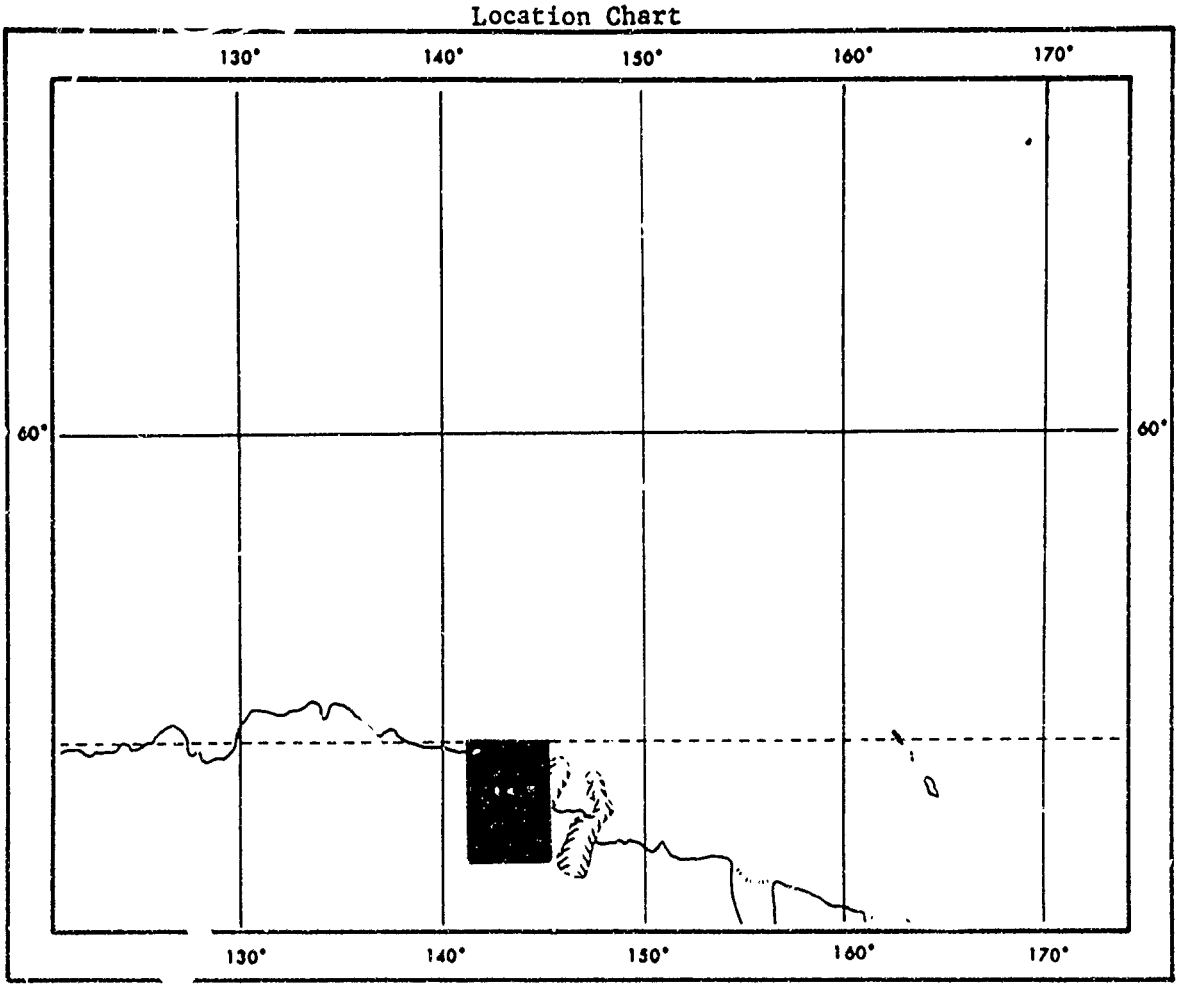
Track Pattern: Triangular search patterns

Altitude: 11,000 feet

Data Format: Inclination contour chart.

17. Search for the South Magnetic Pole, 1960

Location Chart



Aircraft: WV-2 BUNO 126513

Survey Date: 23 October 1960

Navigational Control: Aircraft radar

Miles Surveyed: 8000 square miles

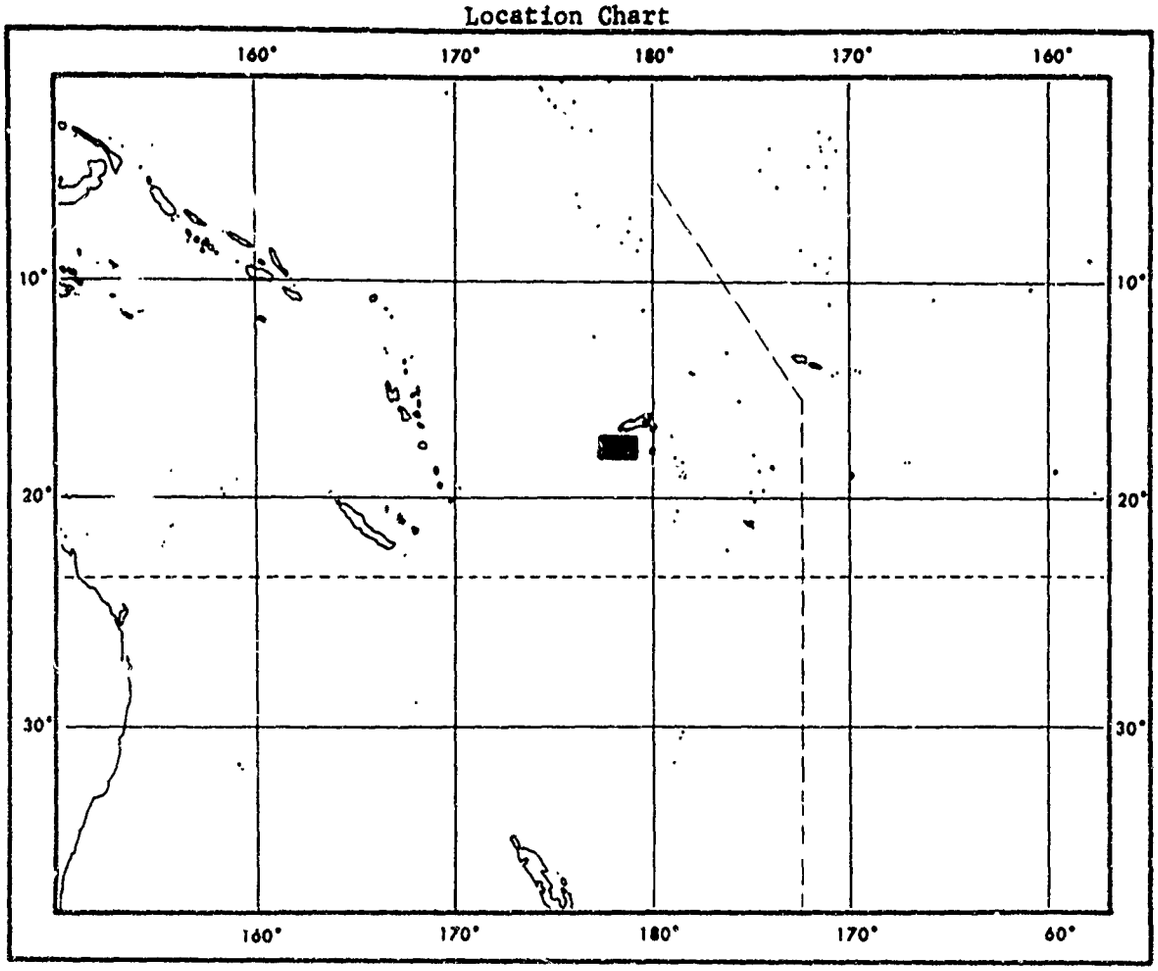
Track Pattern: Triangular search patterns

Altitude: 13,000 feet

Data Format: Inclination contour chart.

18. Aeromagnetic Survey of Viti Levu, Fiji Islands

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Date: November 1964

Navigational Control: Radar and visual

Miles Surveyed: 5000 square miles

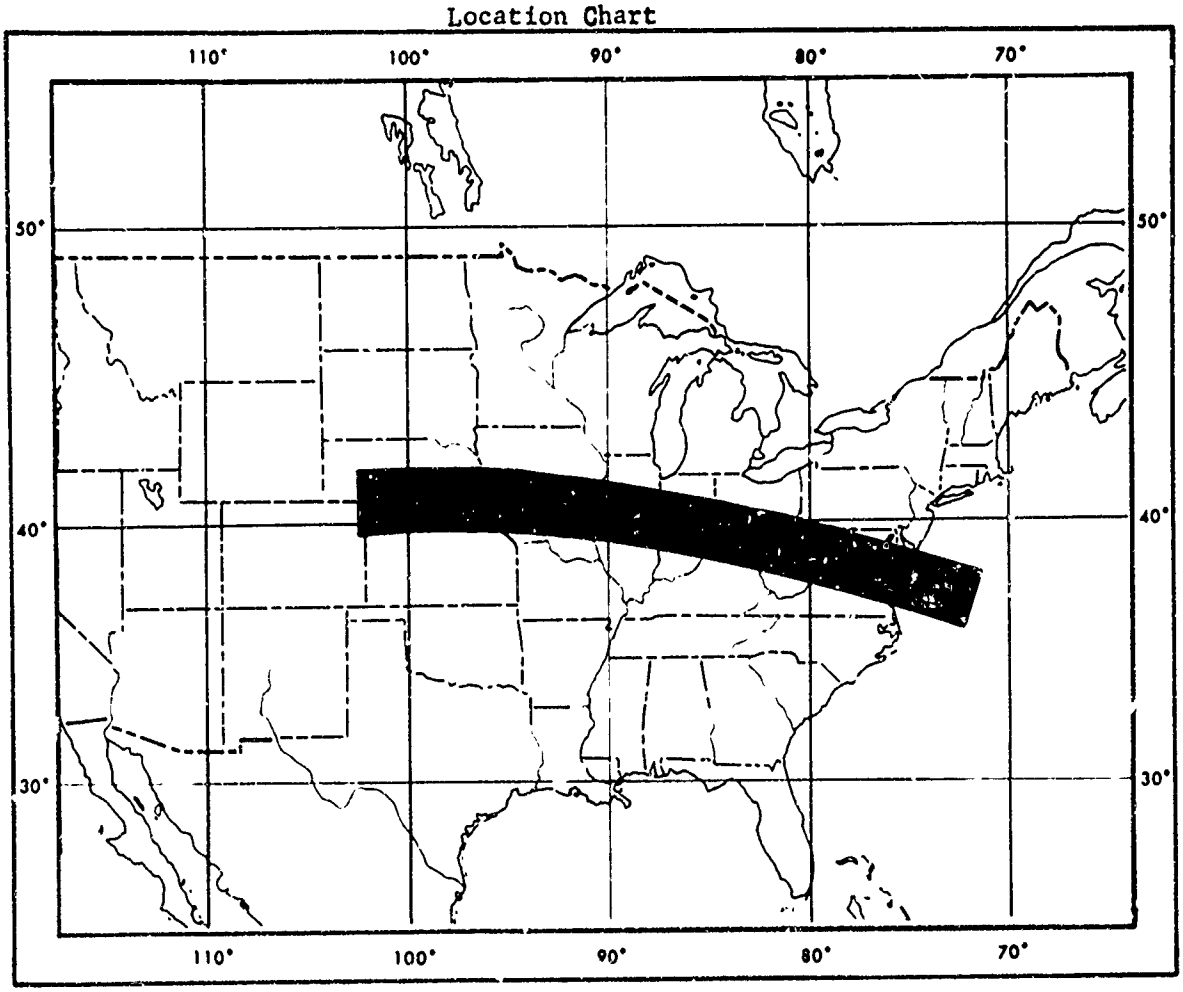
Track Pattern: E-W track orientation; 7 mile track spacing

Altitude: 6500 feet

Data Format: Total magnetic intensity contour chart.

19. A 100 mile wide Crustal Survey across the United States (East of 103°W)

Location Chart



Aircraft: NC-54R BUNO 90396, NC-121K BUNO 145925

Survey Dates: August 1962 - June 1964

Navigational Control: Radar, visual

Miles Surveyed: 140,000 square miles

Track Pattern: 5 mile spacing, E-W track orientation

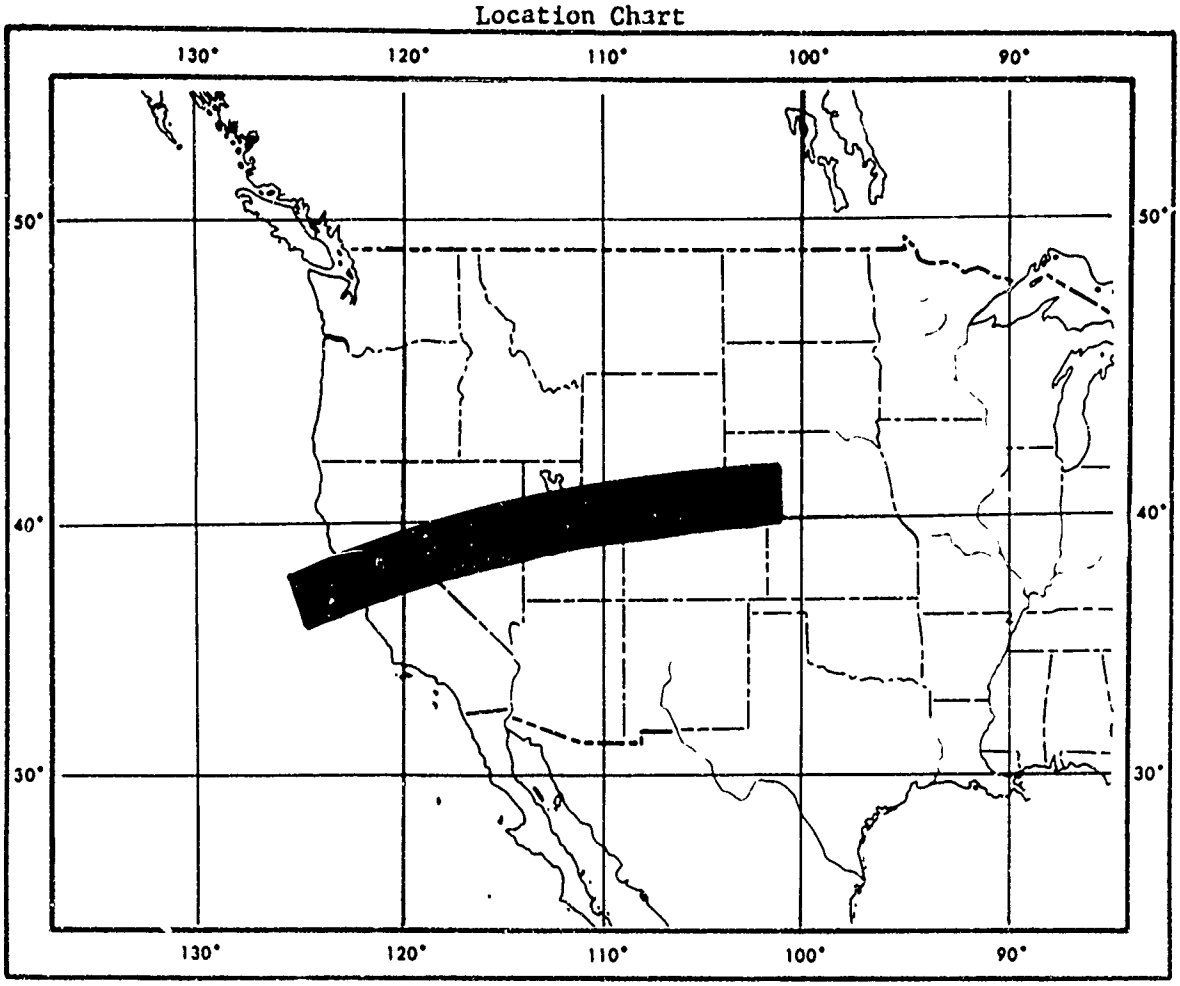
Altitude: 6000 feet

Data Format: Residual total intensity charts and nested profiles.

Reports: 1) "Crustal Study of a Continental Strip from the Atlantic Ocean to the Rocky Mountains," Geological Society of America Bulletin, Vol. 77, p. 1427-1448, December 1966. 2) "Transcontinental Geophysical Survey (35°-39°N)", Miscellaneous Geologic Investigations Maps I-531-A; I-532-A, I-533-A; I-534-A; I-535-A; I-536. Published by the U. S. Geological Survey, Washington, D. C. 20390, 1968.

20. A 100 mile wide Crustal Survey across the United States (West of 102°E)

Location Chart



Aircraft: NC-54R BUNO 90396 and NC-121K BUNO 145925

Survey Dates: August 1962 - February 1965

Navigational Control: Radar, visual

Miles Surveyed: 100,000 square miles

Track Pattern: 5 mile spacing, E-W track orientation

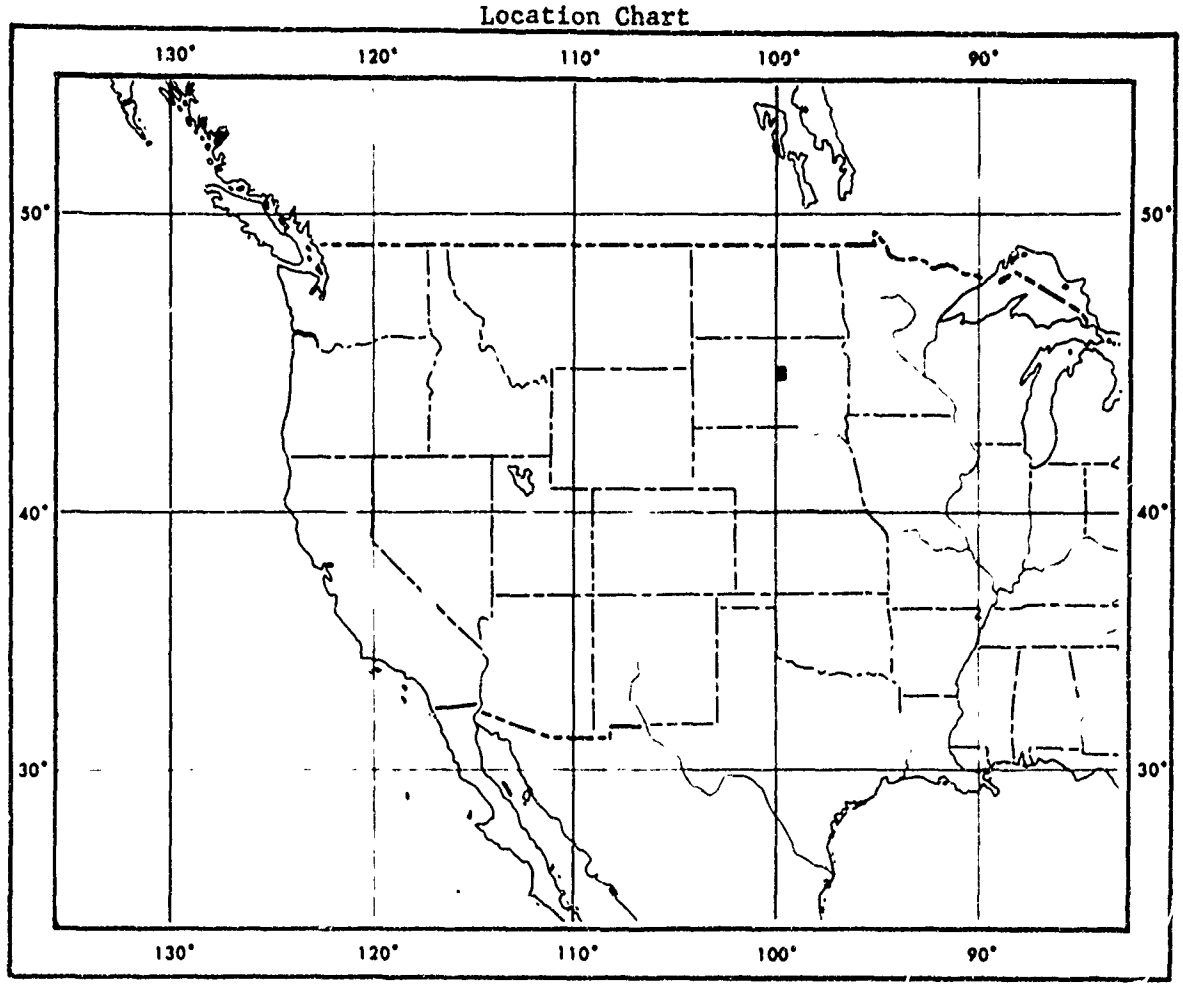
Altitude: 16,000 feet 103°W to San Francisco, 6000 feet over Pacific Ocean and Coastal Range.

Data Format: Contour charts and profiles in preparation.

Reports: 1) "Transcontinental Geophysical Survey (35° - 39°N)", Miscellaneous Geologic Investigations Maps I-531-A; I-532-A; I-533-A; I-534-A; I-535-A; I-536. Published by the U. S. Geological Survey, Washington, D. C. 20390, 1968.
2) "Aeromagnetic Investigation of Crustal Structure for a Strip Across the Western United States", Geological Society of America Bulletin, Vol. 80, September 1969.

21. Central South Dakota Survey

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Date : December 1964

Navigational Control: Ground radar

Miles Surveyed: 1500 square miles

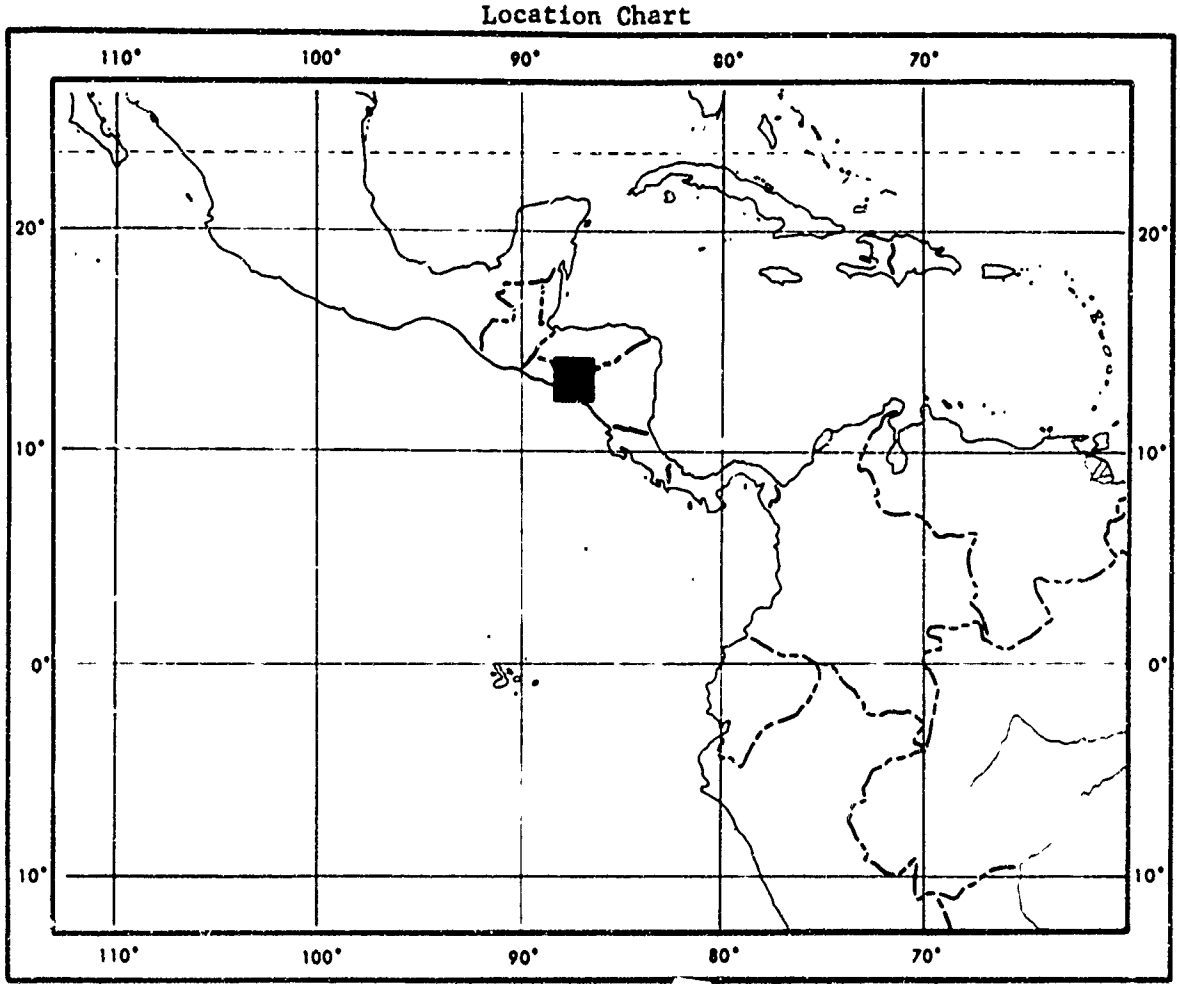
Track Pattern: 2-mile track spacing, E-W track orientation

Altitude: 500 feet above terrain and 1700 feet above terrain.

Data Format: Total magnetic intensity contour chart at 500 feet.

22. Gulf of Fonseca Survey

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Date: October 1964

Navigational Control: Aircraft radar, visual

Miles Surveyed: 24,000 square miles

Track Pattern: 8-mile track spacing, E-W orientation

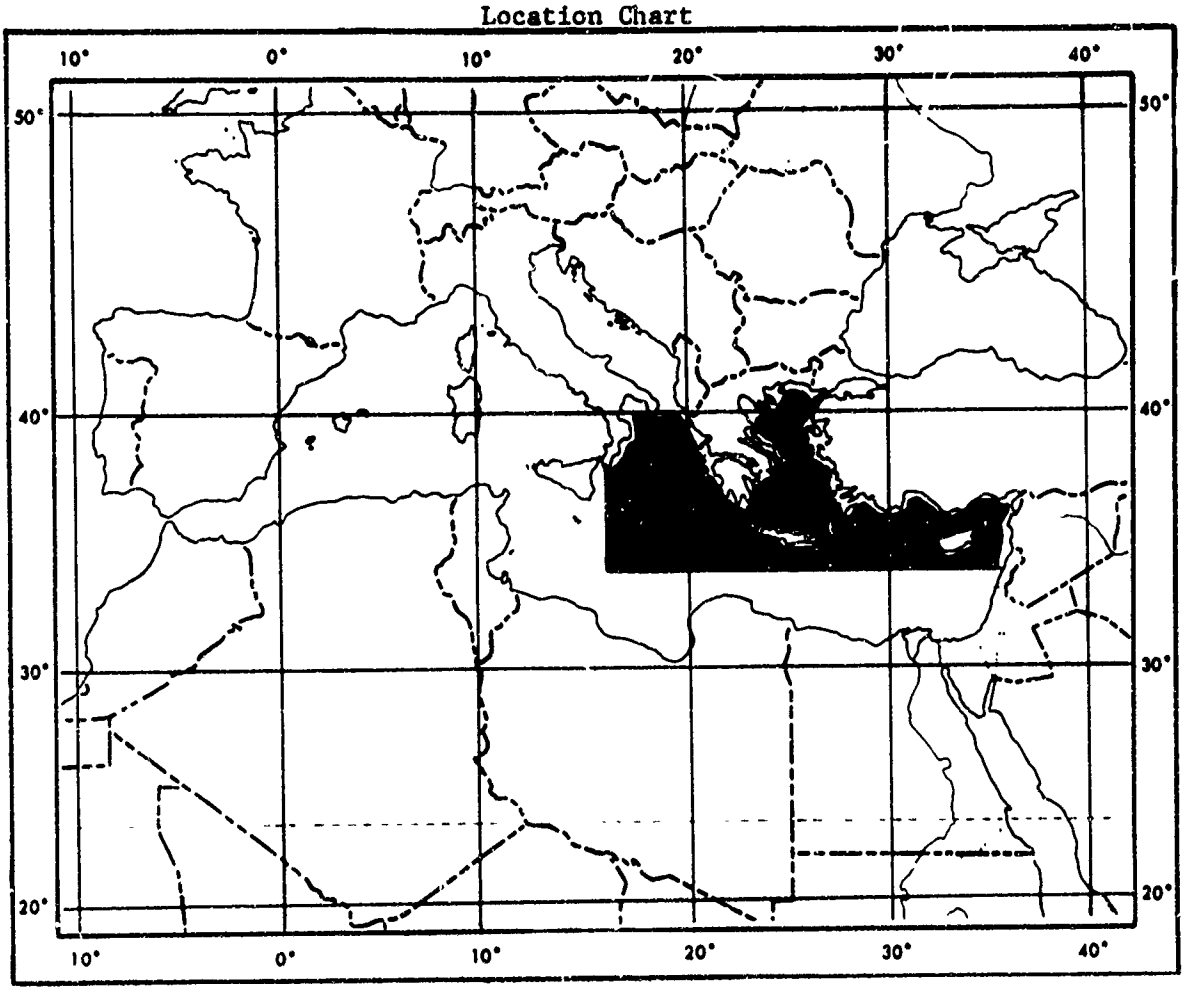
Altitude: 7200 feet south of 13°30'N, 9300 feet north of 13°30'N

Data Format: Total magnetic intensity contour chart.

Reports: "Aeromagnetic Survey of the Gulf of Fonseca," presented at Xth Pan American Consultation on Cartography, Pan American Institute on Geography and History, Guatemala City, Guatemala, 25 June-10 July 1965.

23. Eastern Mediterranean Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: July - September 1957

Navigational Control: Aircraft radar, Doppler radar, visual

Miles Surveyed: 190,000 square miles

Track Pattern: 10-mile spacing, N-S track orientation with 3 E-W cross tracks

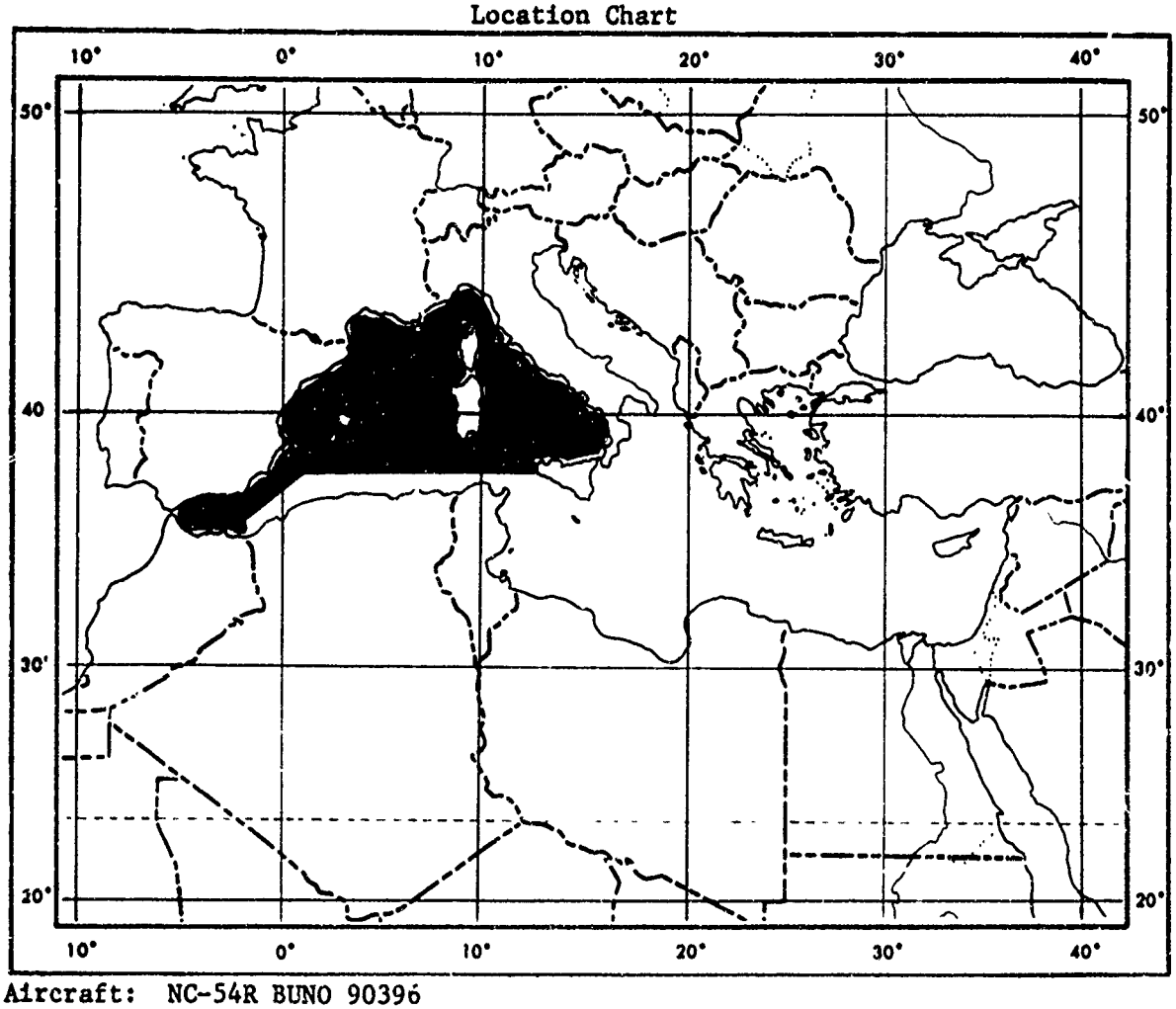
Altitude: 1000 feet

Data Format: Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the combined Eastern and Western Mediterranean Sea surveys are available on microfilm (See Section III-C).

Reports: "An Aeromagnetic Survey of the Eastern Mediterranean Sea and its Interpretation," Earth and Planetary Science Letters, V. 5, pp. 439-448, 1969.

24. Western Mediterranean Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: February - April 1958

Navigational Control: Aircraft radar, Doppler radar, visual

Miles Surveyed: 190,000 square miles

Track Pattern: 10-mile spacing, E-W track orientation primarily with 5 N-S cross tracks

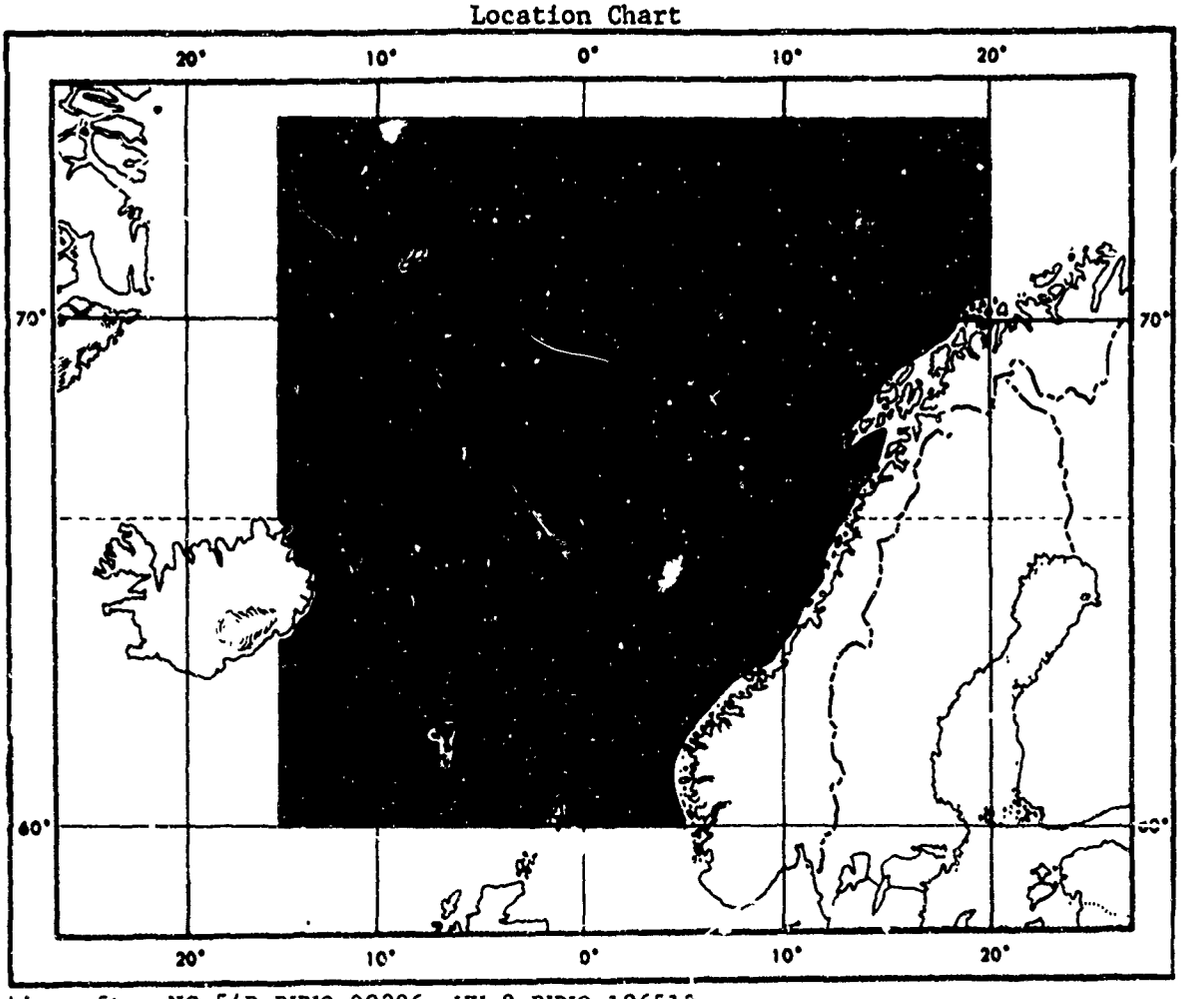
Altitude: 1000 feet

Data Format: Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the combined Eastern and Western Mediterranean Sea surveys are available on microfilm (See Section III-C).

Reports: Technical paper in preparation.

25. Norwegian Sea Survey

Location Chart



Aircraft: NC-54R BUNO 90396, WV-2 BUNO 126513

Survey Dates: July 1958 - June 1959

Navigational Control: Radar, Doppler radar, visual, Loran-A south of 62°

Miles Surveyed: 660,000 square miles

Track Pattern: 10-mile spacing, primarily E-W track orientation.

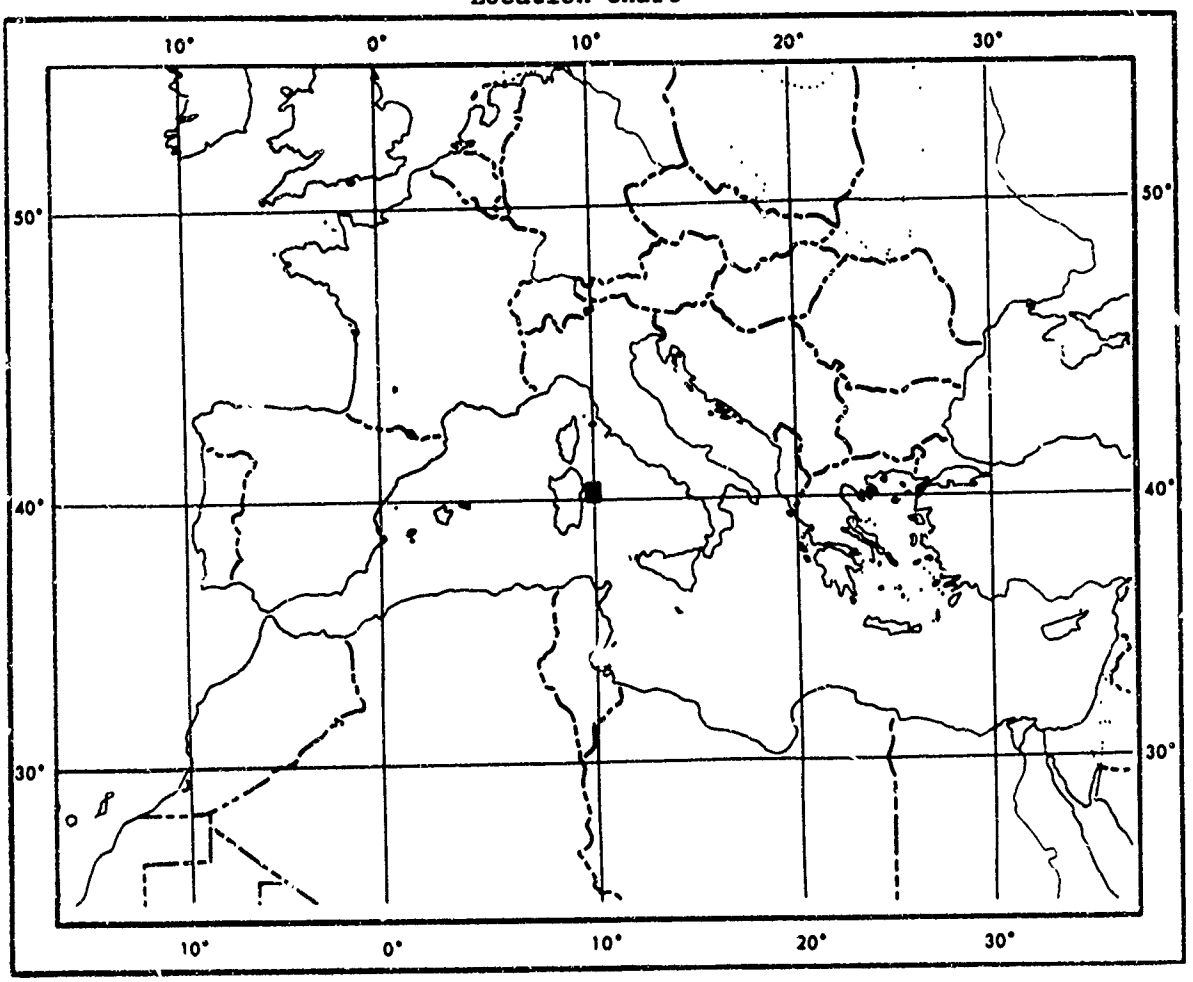
Altitude: 1000 feet

Data Format: Total magnetic intensity contour chart. Copies of the total magnetic intensity analog traces for the Norwegian Sea survey are available on microfilm (See Section III-C).

Reports: "Aeromagnetic Survey of the Norwegian Sea," J. Geophys. Res., V. 73, No. 14, pp. 4583 - 4600, 1968.

26. A Survey in the Western Tyrrhenian Sea

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: September 1957

Navigational Control: Radar, Doppler radar

Miles Surveyed: 900 square miles

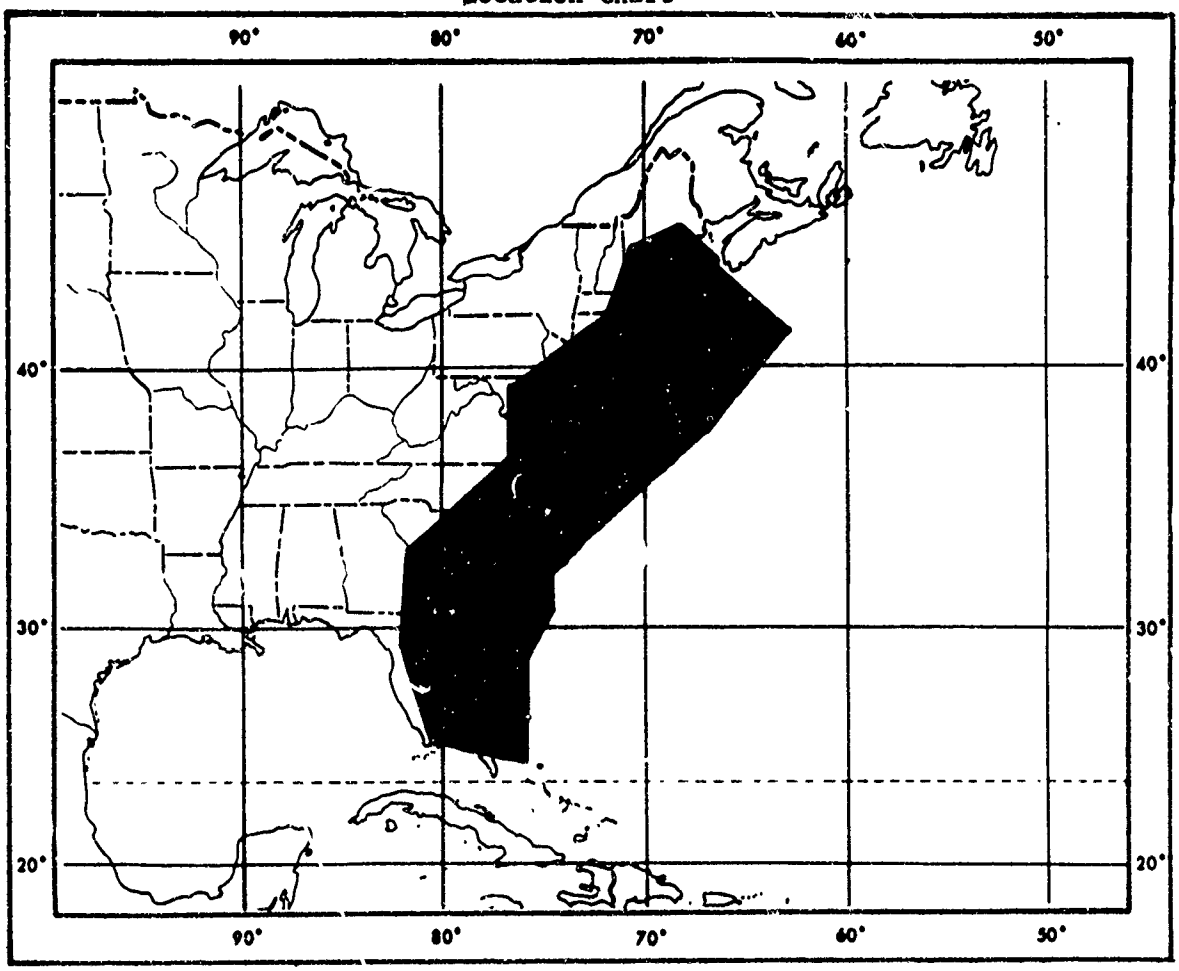
Track Pattern: 3-mile spacing, E-W, N-S grid

Altitude: 1000 feet

Data Format: Total magnetic intensity contour chart.

27. United States Atlantic Coastal Region Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: 27 May 1964 - 30 Oct 1966

Navigational Control: Loran-A, aircraft radar, Doppler radar, and visual

Miles Surveyed: 450,000 square miles

Track Pattern: 5-mile spacing, NW-SE orientation, cross tracks.

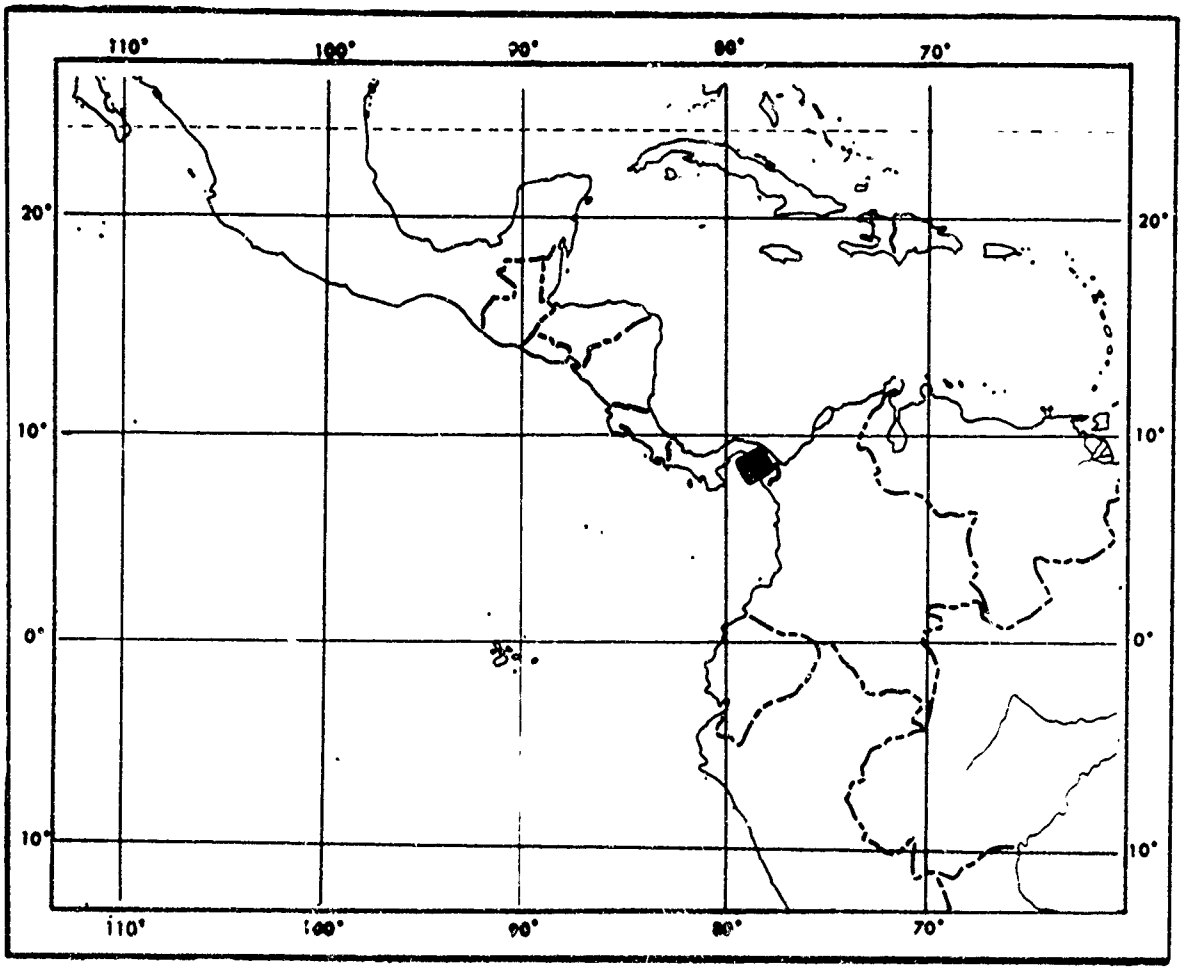
Altitude: 500 feet over the ocean, 2500 feet over land north of the Potomac River, and 1500 feet over land south of the Potomac River.

Data Format: 15 total magnetic intensity contour charts (See page III-B-2). Copies of the total magnetic intensity analog traces for the Atlantic Coastal Region survey are availabie on microfilm (See Section III-C).

Reports: 1) "Geologic Implications of Aeromagnetic Data for the Eastern Continental Margin of the United States," Geophysics, V.33 , No. 5, Oct. 1968

28. Gulf of San Miguel Survey

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Date: January 1966

Navigational Control: Visual, aircraft radar

Miles Surveyed: 4800 square miles at 5000 feet; 900 square miles at 10,000 feet

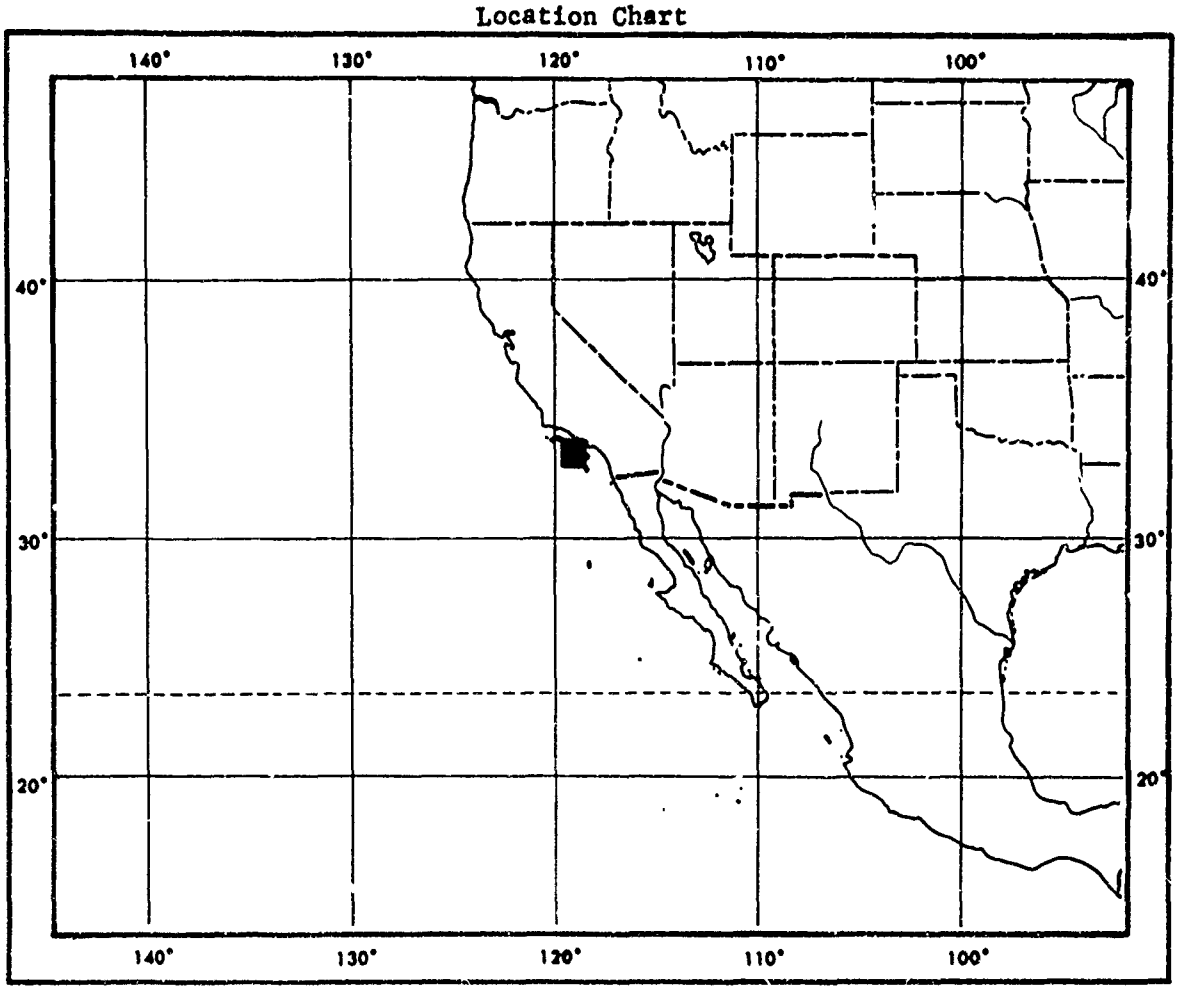
Track Pattern: 3 mile track spacing, NE-SW track orientation

Altitude: 5000 feet and repeated at 10,000 feet

Data Format: Total magnetic intensity contour chart for 5000 foot portion. Copies of the total magnetic intensity analog traces for the Gulf of San Miguel Survey are available on microfilm (Tracks 915, 916 and 917, Reel #36. See Section III-C).

29. Aeromagnetic Survey of an Area off Southern California

Location Chart



Aircraft: NC-4R BUNO 90396

Survey Date: July 1961

Navigational Control: Visual, aircraft radar

Miles Surveyed: 4400 square miles

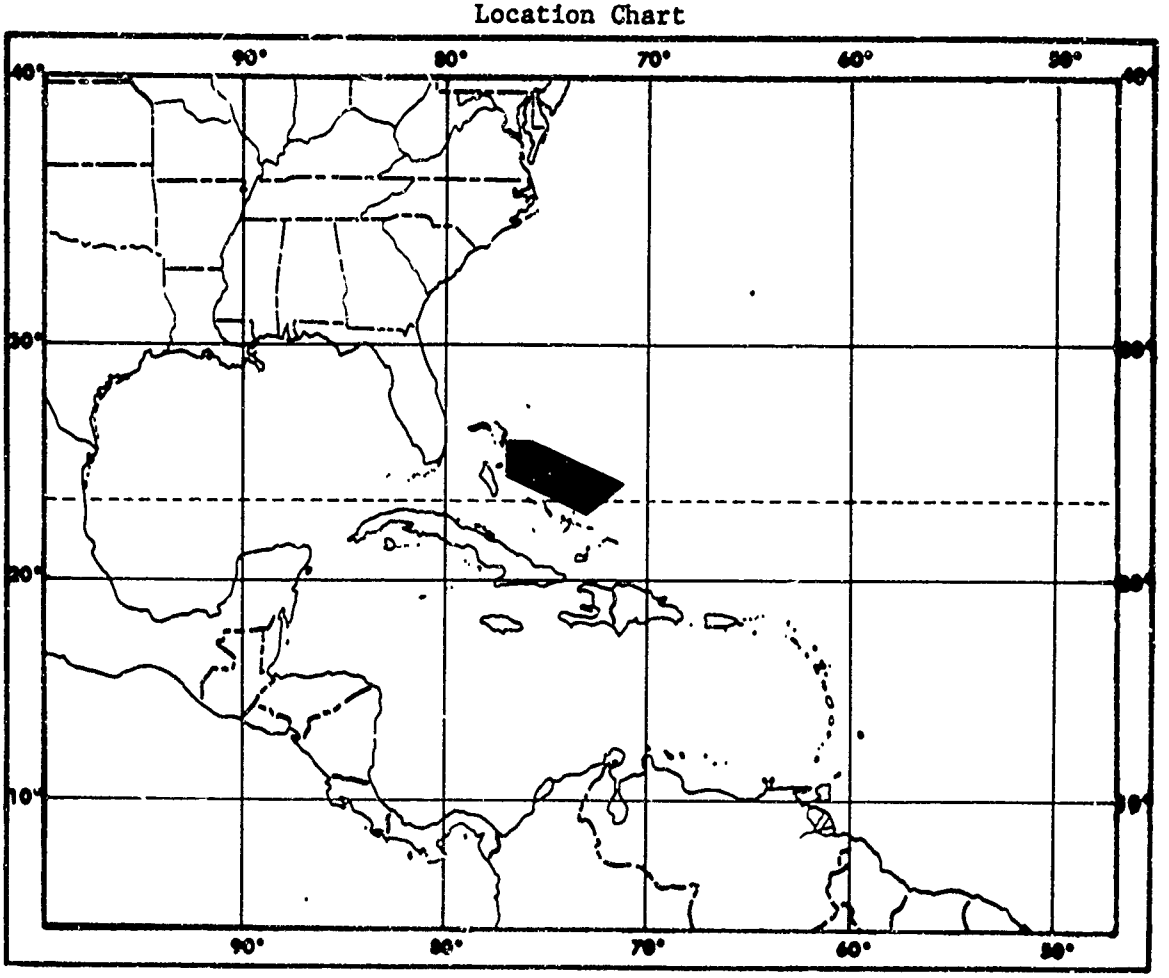
Track Pattern: 2 mile track spacing, N-S track orientation

Altitude: 500 feet

Data Format: Total magnetic intensity contour chart.

30. East Coast Extension Aeromagnetic Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: August 1966

Navigational Control: Loran-A

Miles Surveyed: 47,700 square miles

Track Pattern: 5-mile spacing, NW-SE track orientation

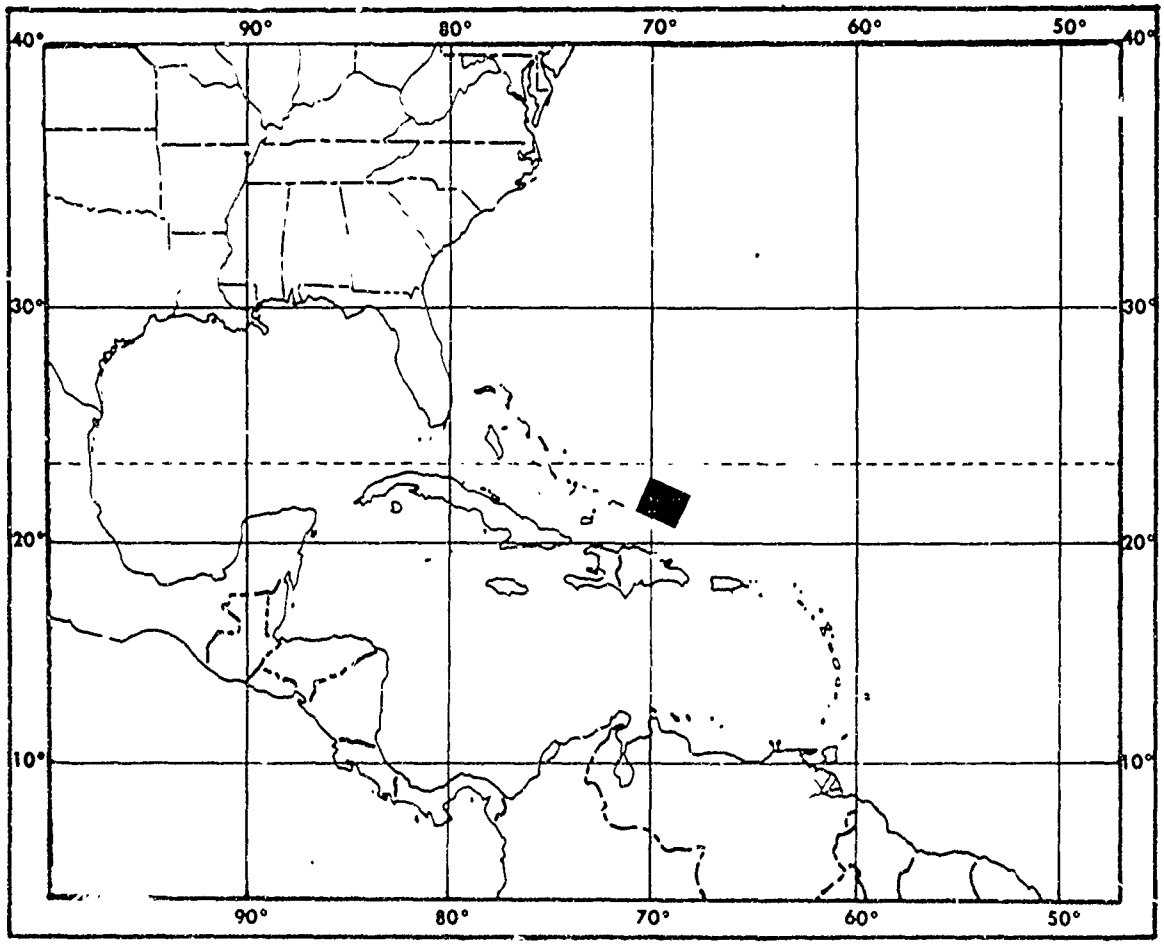
Altitude: 500 feet

Data Format: Residual magnetic intensity contour chart.

Report: These data combined with data from surveys on pages II-A-3, II-B-7, II-B-11, II-B-18, II-B-20, and II-A-31 are reported in "Structural Implications of Magnetic Anomalies North of the Bahama-Antilles Islands," GEOPHYSICS, Vol. 33, No. 6, pp. 950-961.

31. Bahama Holiday Aeromagnetic Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: June 1967

Navigational Control: Loran-A

Miles Surveyed: 19,000 square miles

Track Pattern: 5-mile spacing, NE-SW track orientation

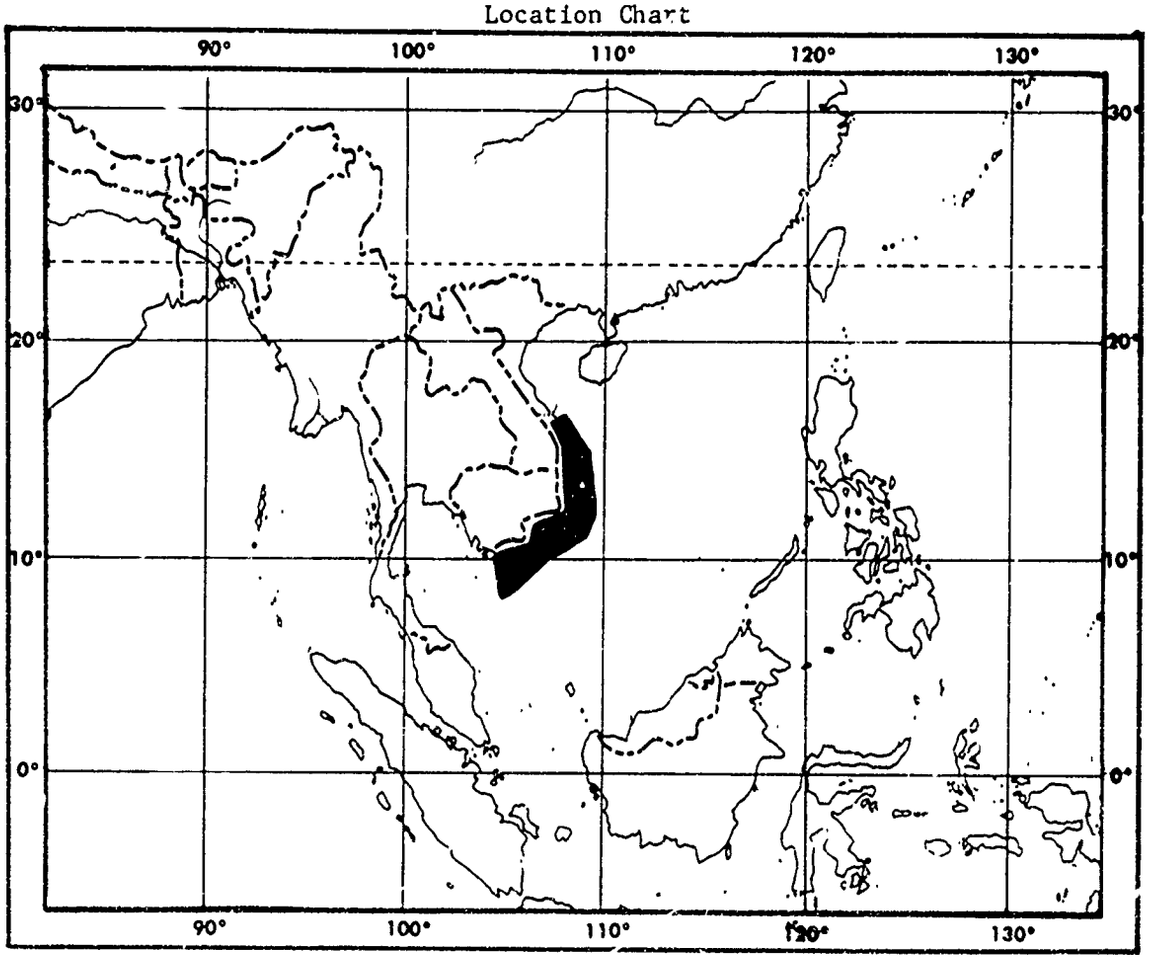
Altitude: 600 feet

Data Format: Residual magnetic intensity contour chart.

Reports: These data combined with data from surveys on pages II-A-3, II-B-7, II-B-[illegible] II-B-18, II-B-20, and II-A-30 are reported in "Structural Implications of Magnetic Anomalies North of the Bahama-Antilles Islands," GEOPHYSICS, Vol. 33, No. 6, pp. 950-961.

32. Aeromagnetic Survey of South Vietnam

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Dates: August - October 1967

Navigational Control: Ground control radar (GCI)

Miles Surveyed: 71,600 square miles

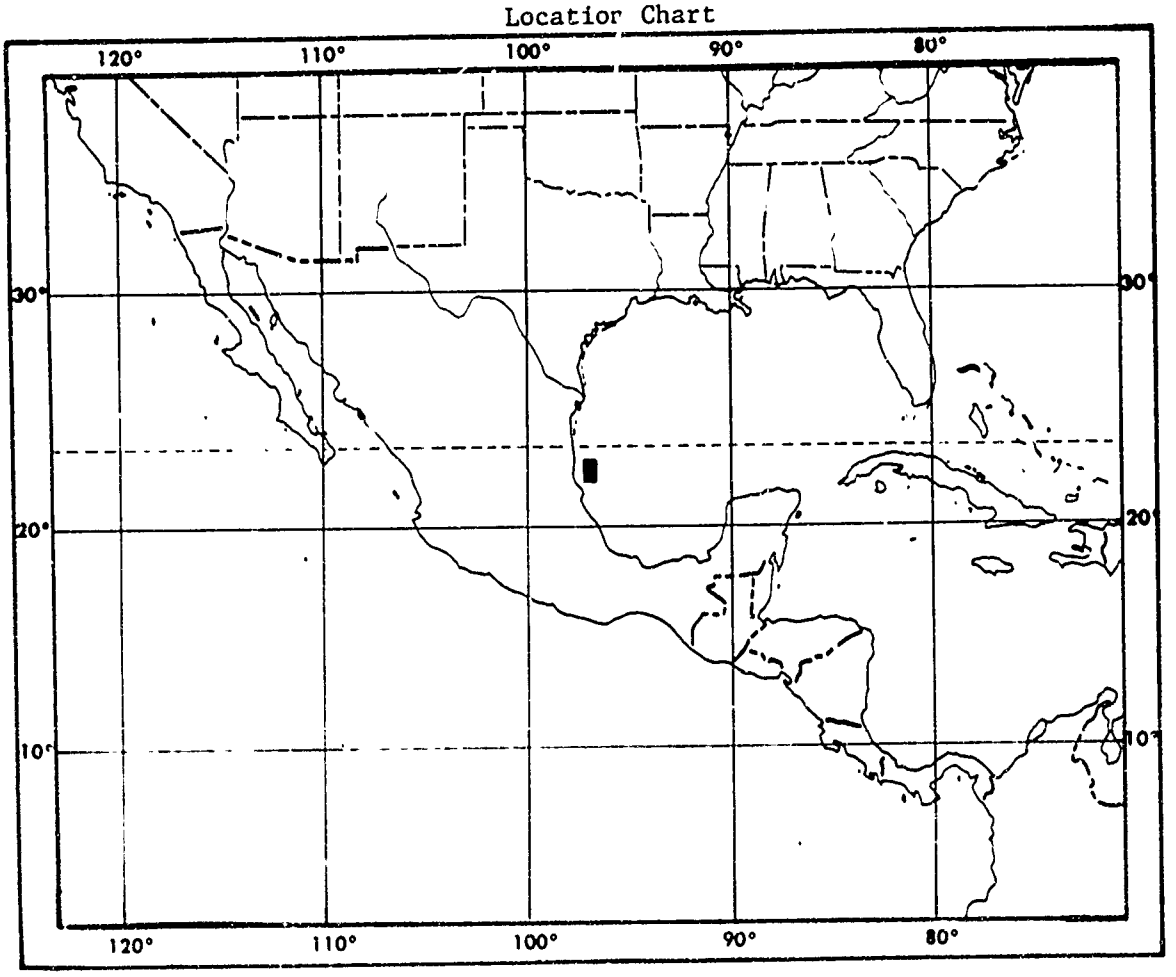
Track Pattern: 5-mile track spacing; south of latitude 12°N, NW-SE track orientation; north of latitude 12°N, E-W track orientation

Altitude: South of latitude 12°N, 6,500 feet; north of latitude 12°N, 10,500 feet

Data Format: Total magnetic intensity and magnetic variation contour charts.

33. Aeromagnetic Survey of Tampico Bank

Location Chart



Aircraft: NC-121K BUNO 145925

Survey Date: 26 February 1967

Navigational Control: Visual, radar fixes, and dead reckoning using doppler navigator

Miles Surveyed: 5,500 square miles

Track Pattern: 4-mile spacing, NW-SE track orientation

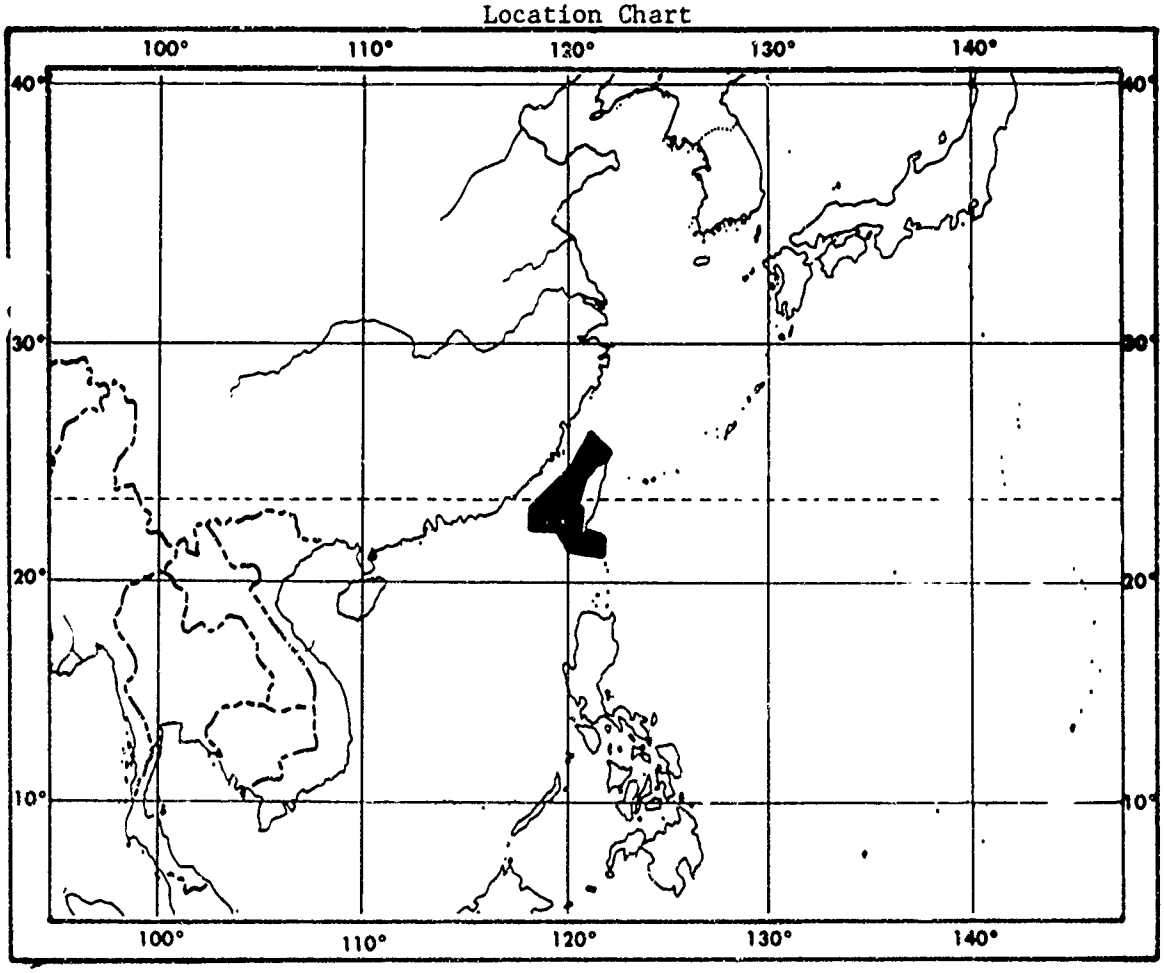
Altitude: 1,0C' feet

Data Format: Total magnetic intensity contour chart.

Report: IR No. 67-89, "Aeromagnetic Survey of Tampico Bank"

34. Taiwan Strait Aeromagnetic Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: April - June 1968

Navigational Control: Celestial, visual, Tacan, Loran-A

Miles Surveyed: 25,000 square miles

Track Pattern: 4-mile spacing; NW-SE track orientation

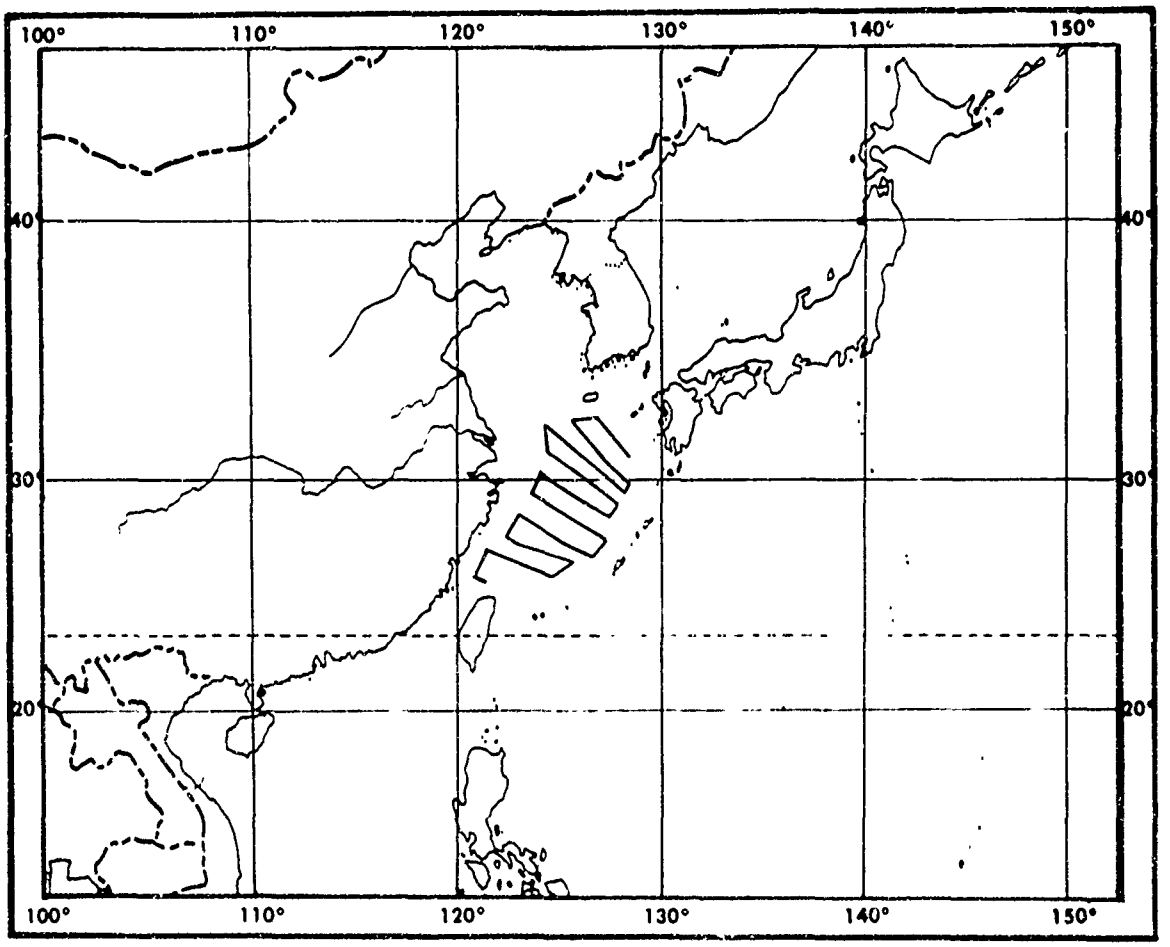
Altitude: 500 feet

Data Format: Total magnetic intensity contour charts.

Reports: Technical paper in preparation

35. East China Sea Aeromagnetic Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Date: June 1968

Navigational Control: Celestial, Tacan, Loran-A

Miles Surveyed: 2,500 line miles

Track Pattern: 50-mile spacing; NW-SE track orientation

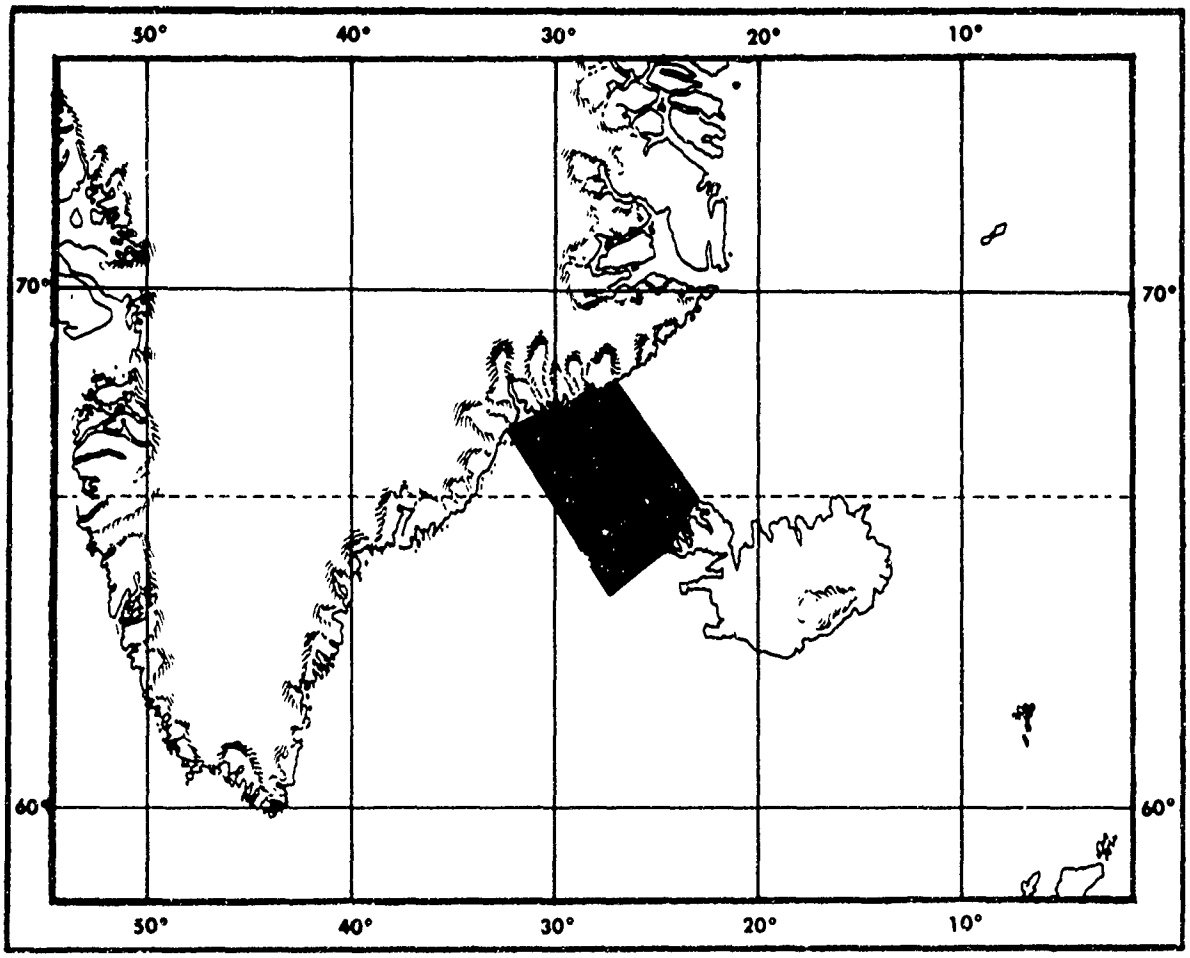
Altitude: 500 feet

Data Format: Residual profiles.

Reports: Technical paper in preparation.

36. Denmark Strait Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: August - September 1968

Navigational Control: Loran-A, Aircraft radar, Doppler radar, visual

Miles Surveyed: 30,000 square miles

Track Pattern: 5 mile spacing, NW-SE orientation, cross tracks

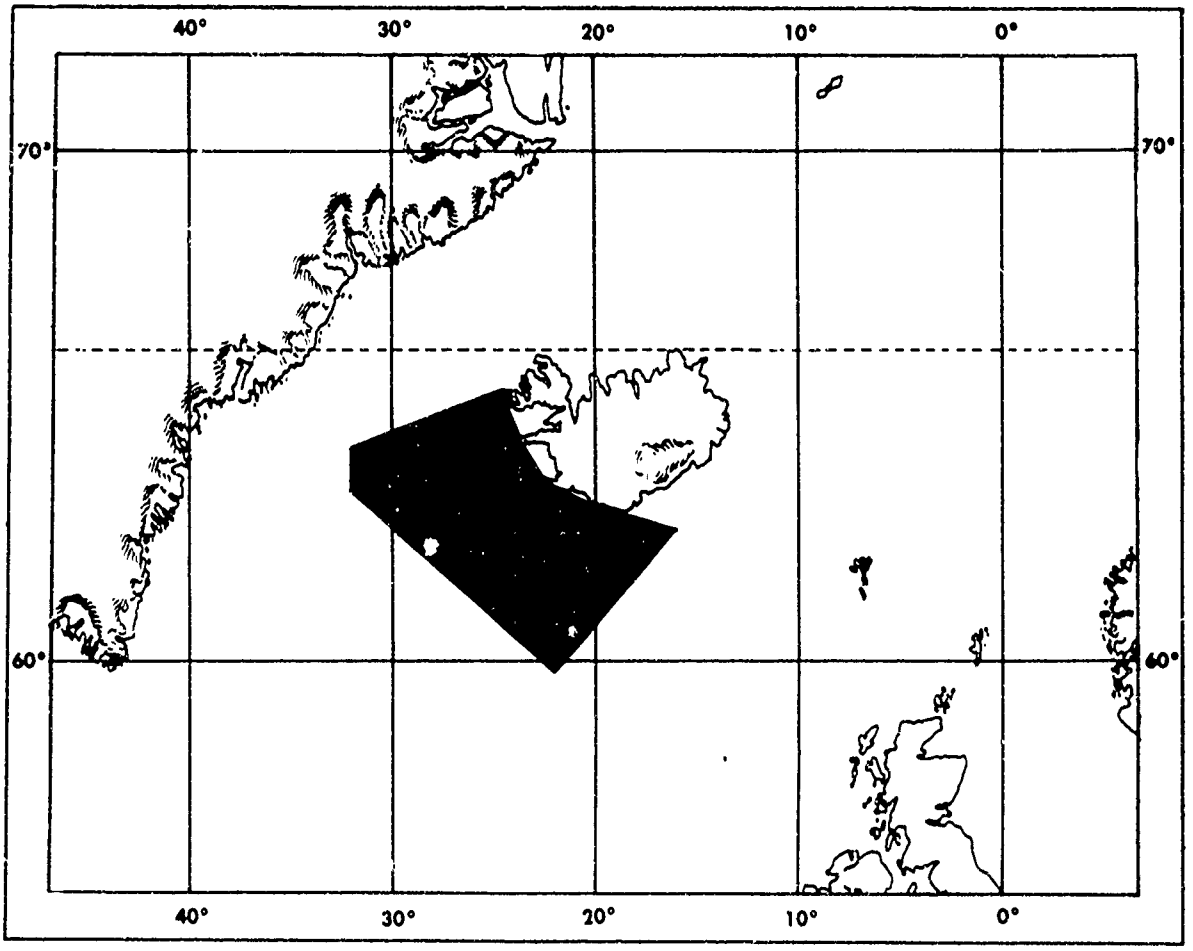
Altitude: 600 feet

Data Format: Total magnetic intensity contour charts in preparation

Reports: Technical report in preparation

37. Upper Reykjanes Ridge Survey

Location Chart



Aircraft: NC-54 BUNO 90396

Survey Dates: September - October 1968

Navigational Control: Loran-A, Aircraft radar, Doppler radar, visual

Miles Surveyed: 60,000 square miles

Track Pattern: 5-15 miles flying Loran A station 1L4 rate, generally NW-SE orientation, cross tracks

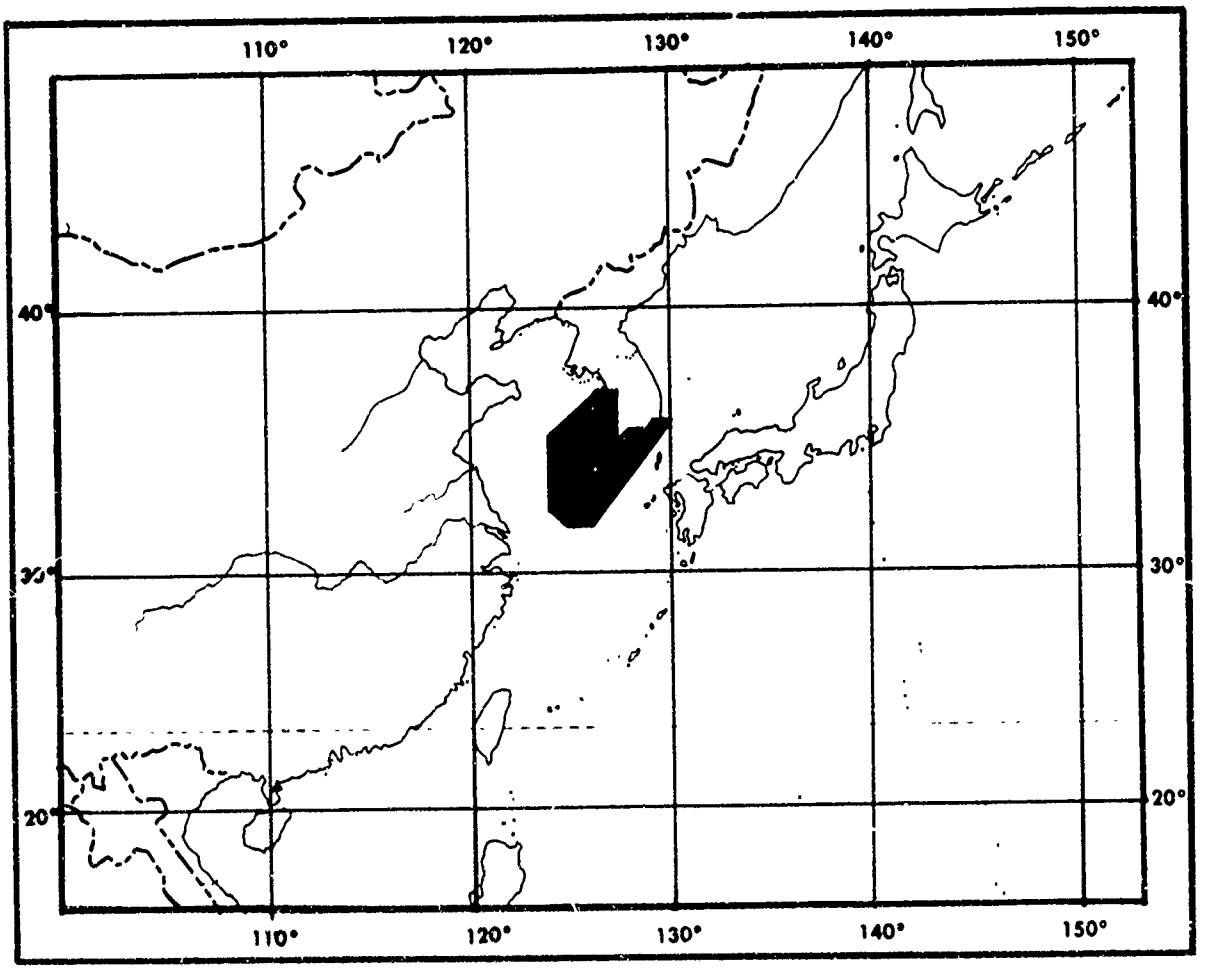
Altitude: 600 feet

Data Format: Total magnetic intensity contour charts in preparation

Reports: Technical report in preparation

38. Korean Continental Shelf Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: February - March 1969

Navigational Control: Loran A, aircraft radar, Doppler radar, and visual fix

Miles Surveyed: 47,150 square miles

Track Pattern: 4-mile spacing, E-W orientation, cross tracks

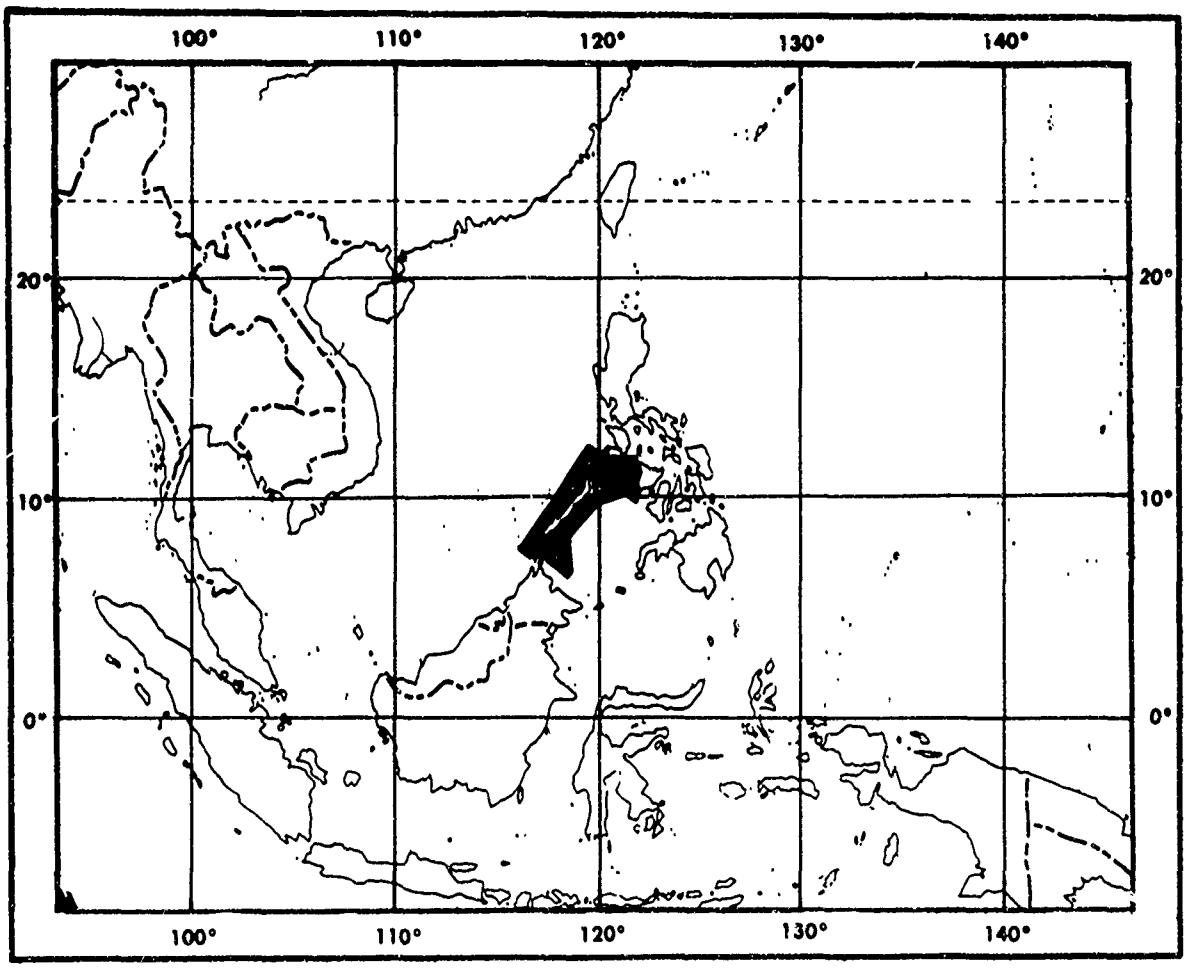
Altitude: 600 feet over the ocean, 3500 feet over adjacent coastal areas, 7200 feet over Cheju-Do

Data Format: Total magnetic intensity contour charts

Reports: Technical report in preparation

39. Palawan Island Continental Shelf Survey

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: June 1969

Navigational Control: Loran A, aircraft radar, Doppler radar, and visual

Miles Surveyed: 41,350 square miles

Track Pattern: 4-mile spacing, NW-SE orientation, cross tracks

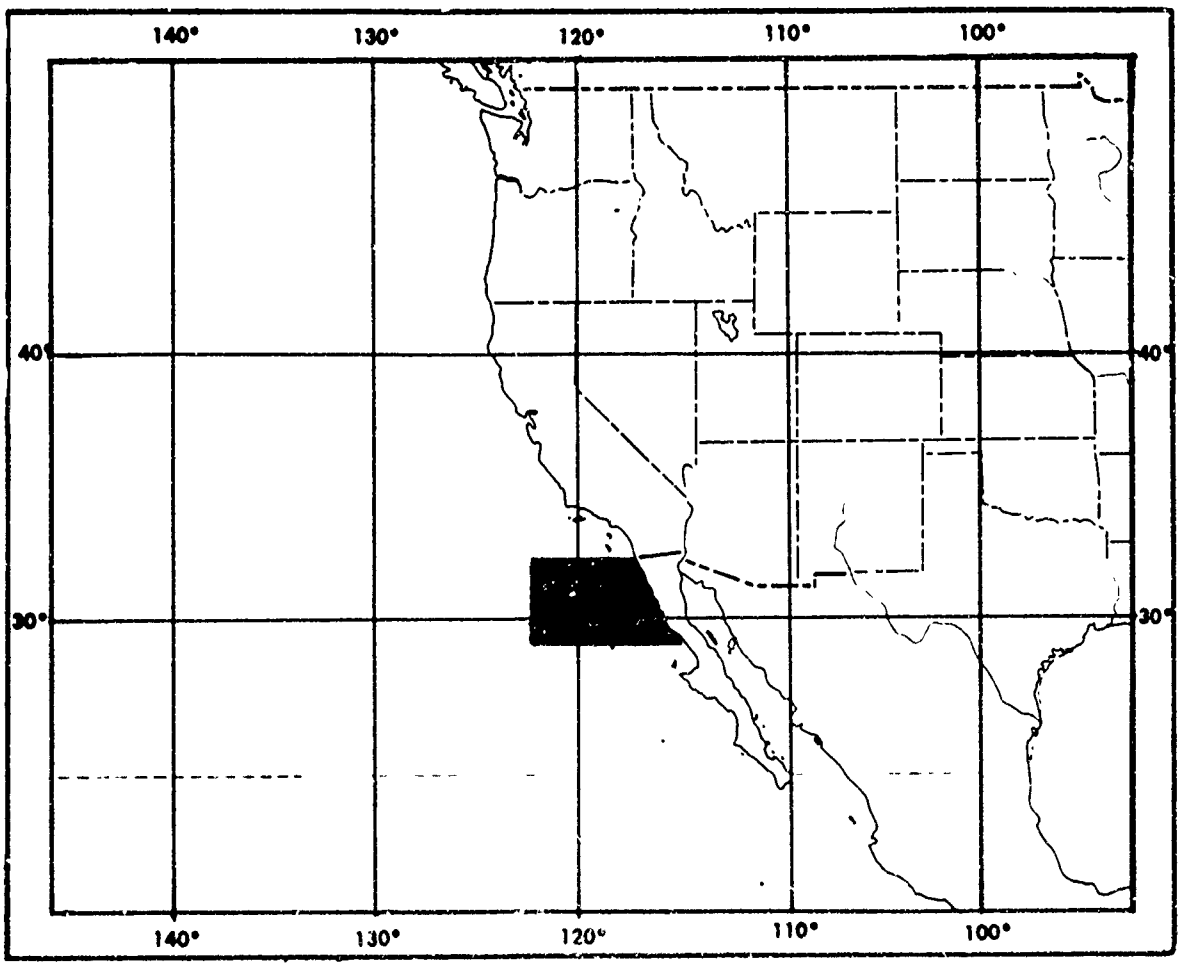
Altitude: 1000 feet

Data Format: Total magnetic intensity contour charts in preparation

Reports: Technical paper in preparation

40. An Aeromagnetic Survey Southwest of San Diego

Location Chart



Aircraft: NC-54R BUNO 90396

Survey Dates: August 1969

Navigational Control: Loran A, aircraft radar, Doppler radar, visual

Miles Surveyed: 63,000 square miles

Track Pattern: 10 mile track spacing, E-W track orientation, cross tracks

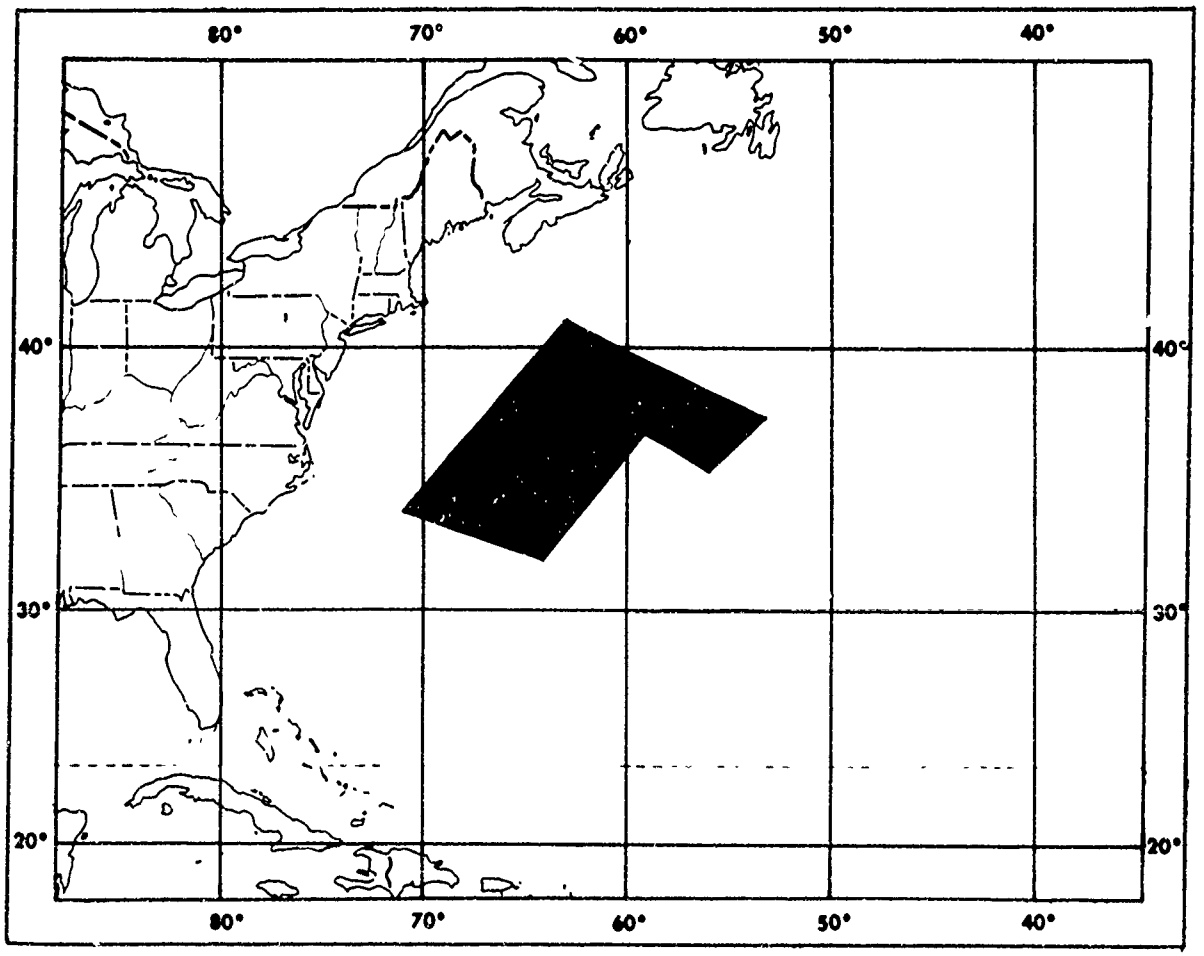
Altitude: 1000 feet

Data Format: Total magnetic intensity contour in preparation

Reports: Technical report in preparation

41. Aeromagnetic Survey North of Bermuda

Location Chart



Aircraft: NC-121, BUNO 145925

Survey Dates: November - December 1969

Navigational Control: Loran A, Doppler radar

Miles Surveyed: 205,000 square miles

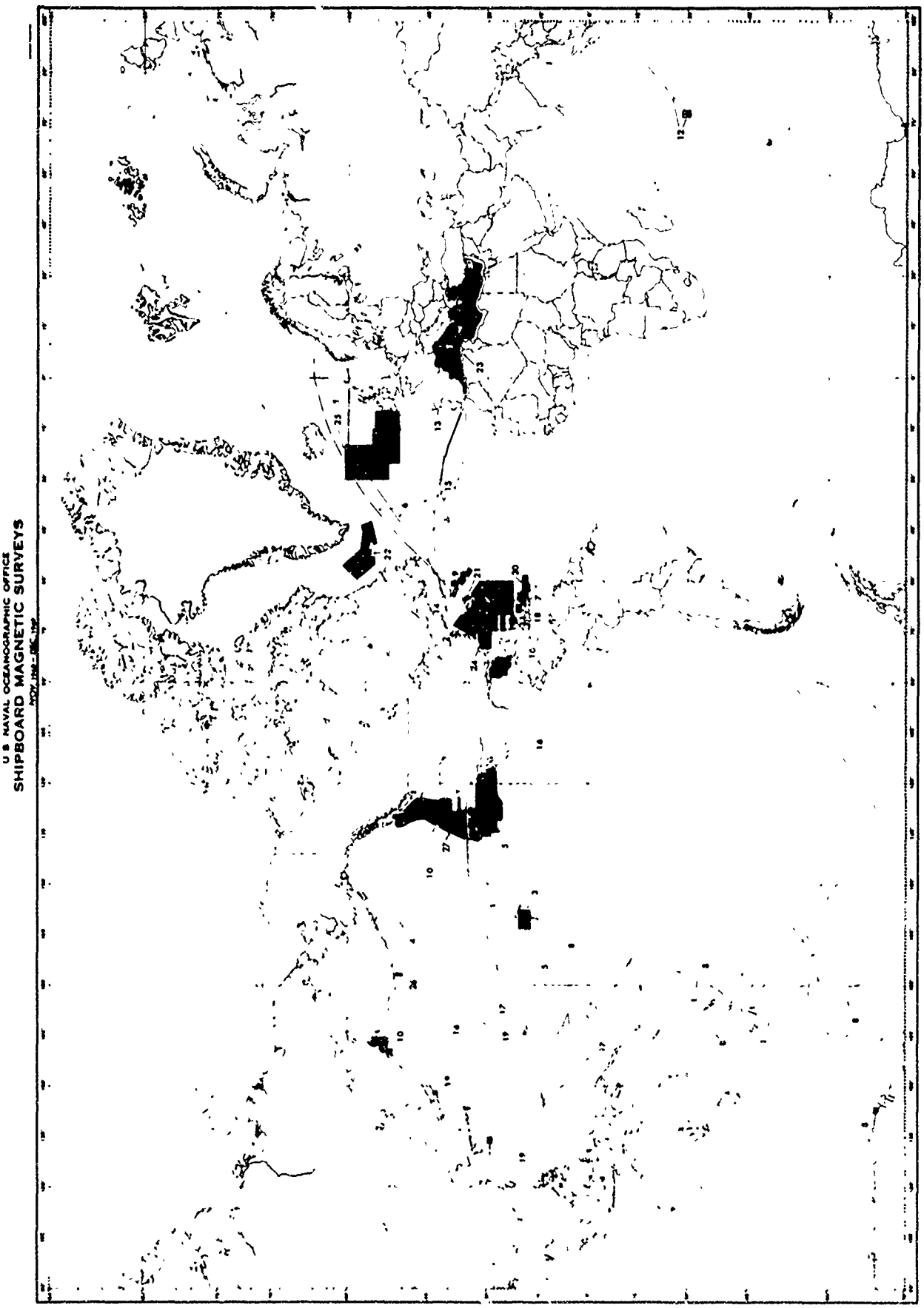
Track Pattern: 10 mile spacing, NW-SE orientation; cross tracks

Altitude: 1000 ft.

Data Format: Total magnetic intensity charts in preparation

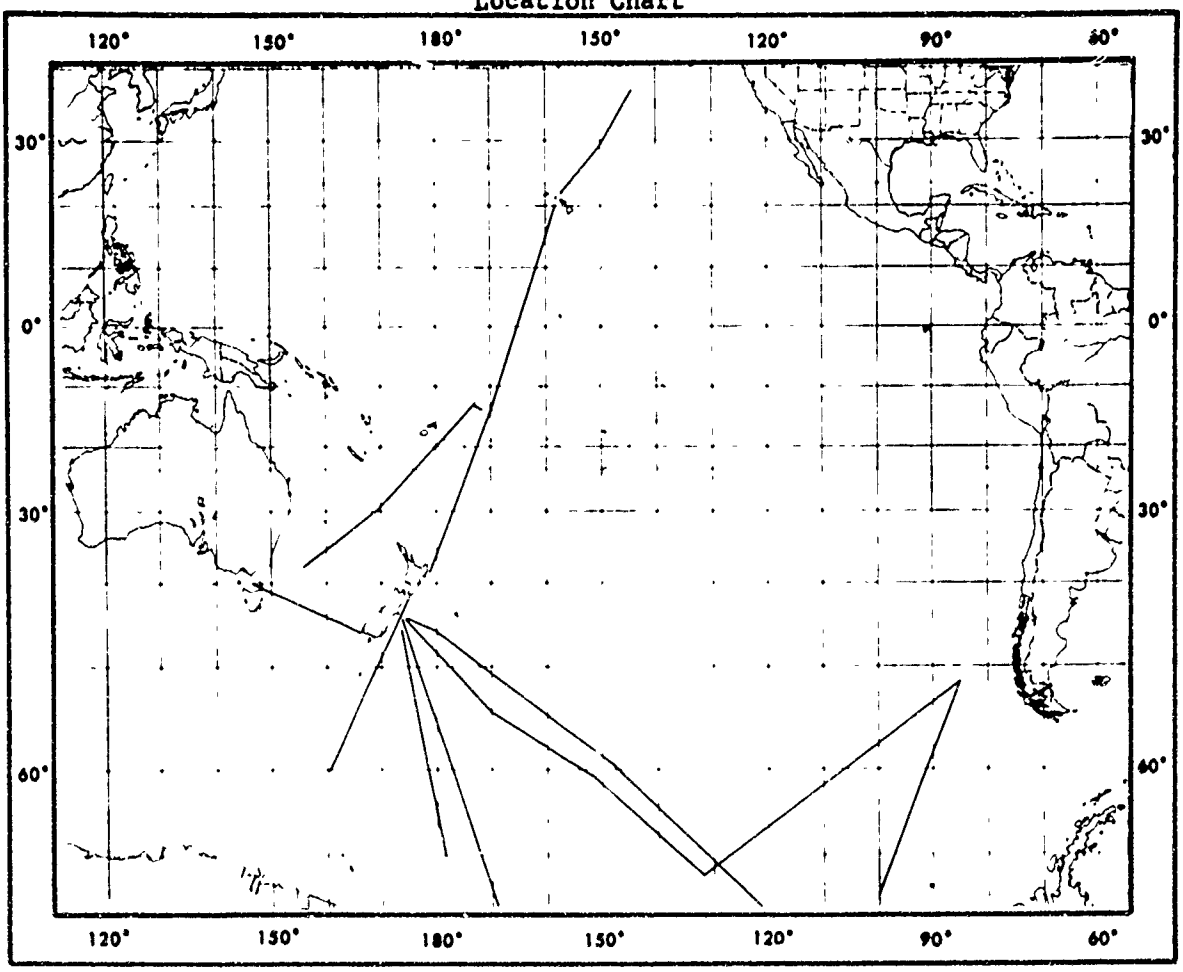
Reports: Technical paper in preparation

B. SHIPBOARD SURVEYS



1. Deep Freeze 1961

Location Chart



Ship: USS STATEN ISLAND (AGB-5)

Survey Dates: 7 November 1960 - 5 May 1961

Navigational Control: Celestial and dead reckoning

Miles Surveyed: 22,000 nautical miles

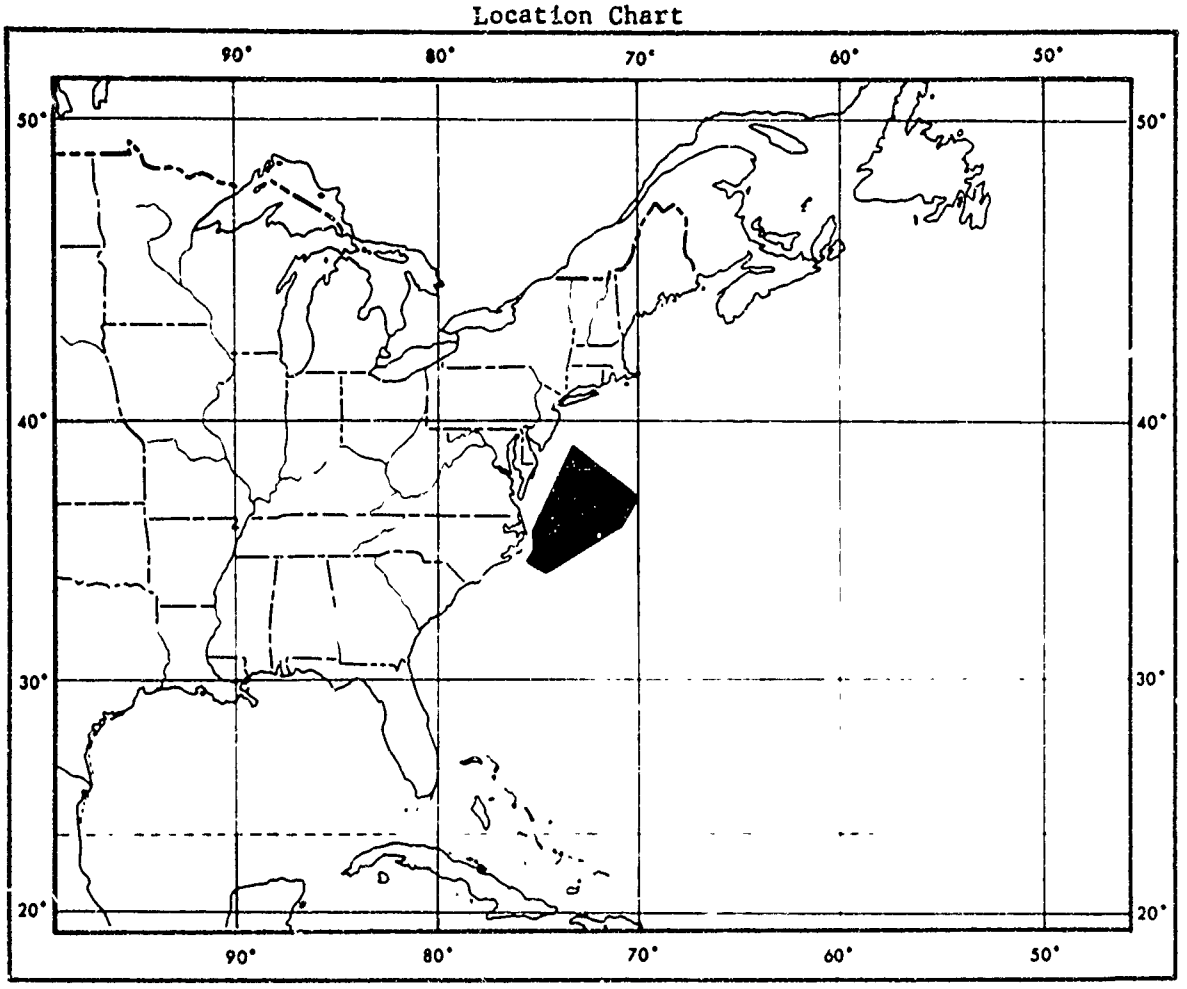
Track Pattern: Single track

Data Format: Profiles of magnetic intensity with regional gradient removed plotted along tracks on bathymetric contour chart in Antarctic region. Certain magnetic and bathymetric profiles presented separately. Magnetic data collected from U. S. to New Zealand presented in total intensity profile form.

Reports: Technical Report 105, "Operation Deep Freeze 61, 1960 - 1961 Marine Geophysical Investigations."

2. U. S. East Coast Survey

Location Chart



Ship: USS PREVAIL (AGS-20)

Survey Dates: 17 - 25 July 1961

Navigational Control: Loran-A and radar

Miles Surveyed: 43,200 square miles

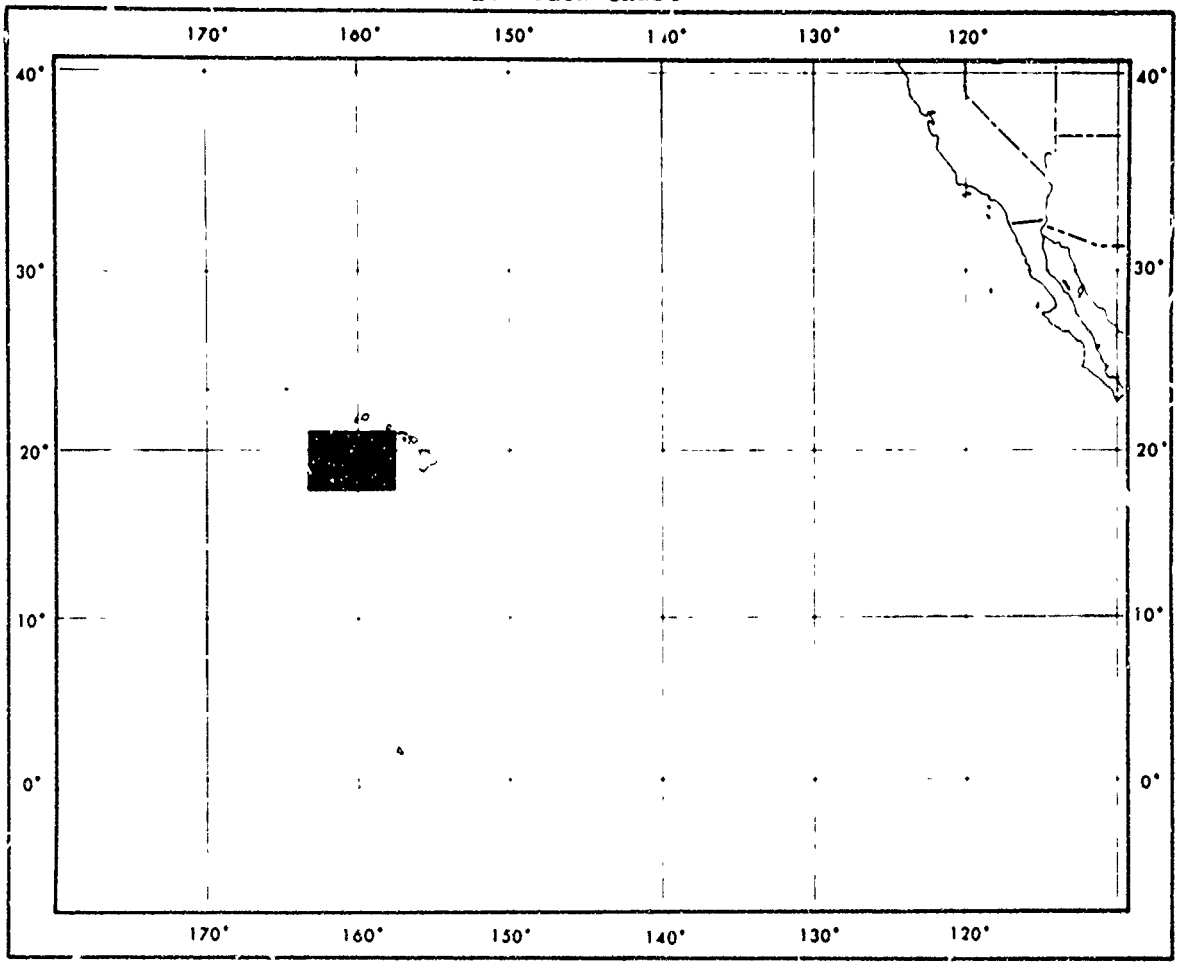
Track Pattern: 30-mile spacing, normal to the continental slope

Data Format: Total and residual magnetic intensity contour charts. Magnetic and bathymetric profiles along each track.

Reports: Technical Report 133, "A Marine Magnetic Survey off the East Coast of the United States."

3. Survey South of the Hawaiian Islands

Location Chart



Ship: USS REHOBOTH (AGS-50)

Survey Dates: June - July 1961

Navigational Control: Loran-A

Miles Surveyed: 56,000 square miles

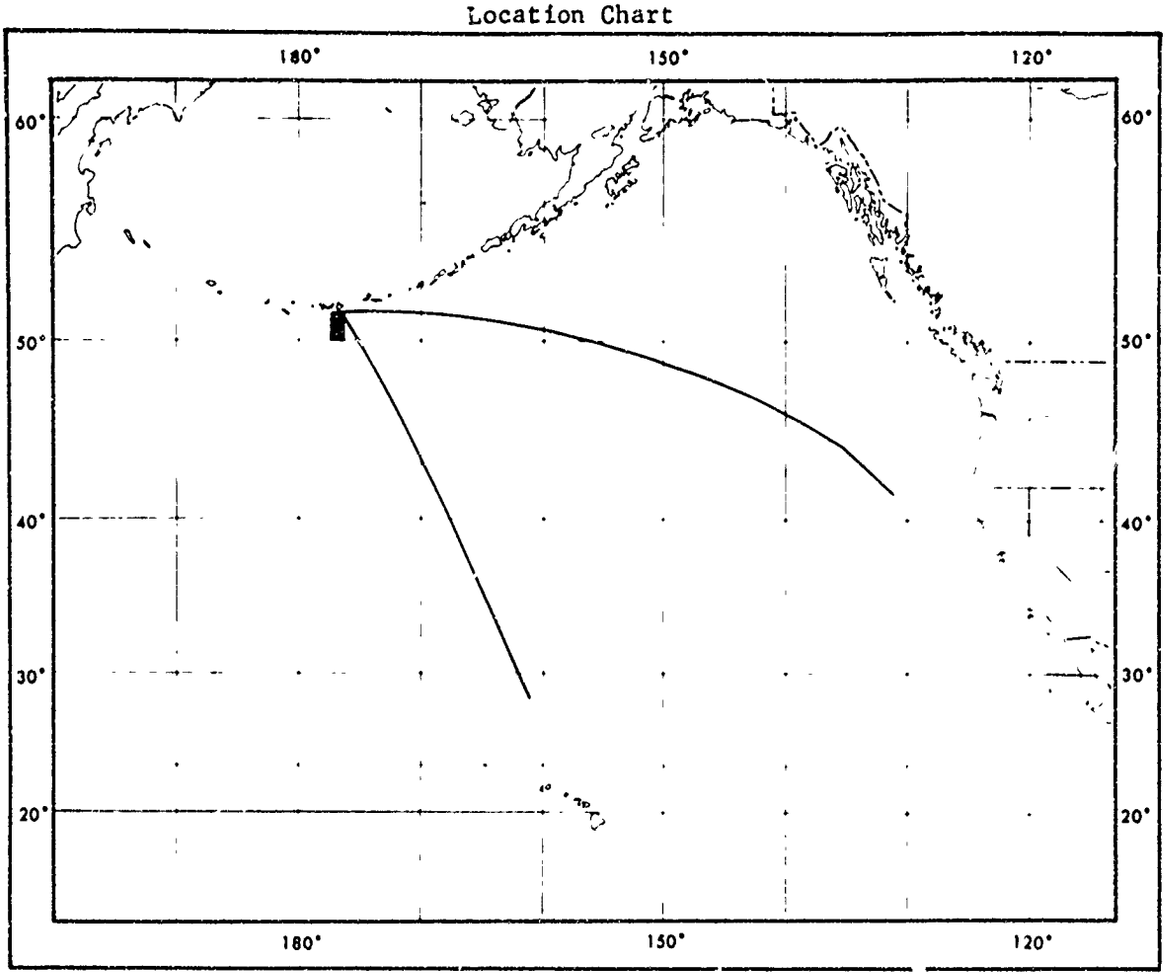
Track Pattern: 5 to 7 mile spacing, in E-W direction

Data Form t: Total and residual intensity contour charts of the entire survey area. Total intensity and bathymetric profiles across the major magnetic feature in the area. Eight detailed development areas over seamounts within the area.

Reports: Technical Report 137, "A Marine Magnetic Survey South of the Hawaiian Islands."

4. North Pacific Survey - 1961

Location Chart



Ship: USS REHOBOTH (AGS-50)

Survey Dates: 9 September - 7 No ber 1961

Navigational Control: Loran-C, celestial, and dead reckoning

Miles Surveyed: 3,600 nautical miles; additional 2,500 square mile survey area over Aleutian Trench.

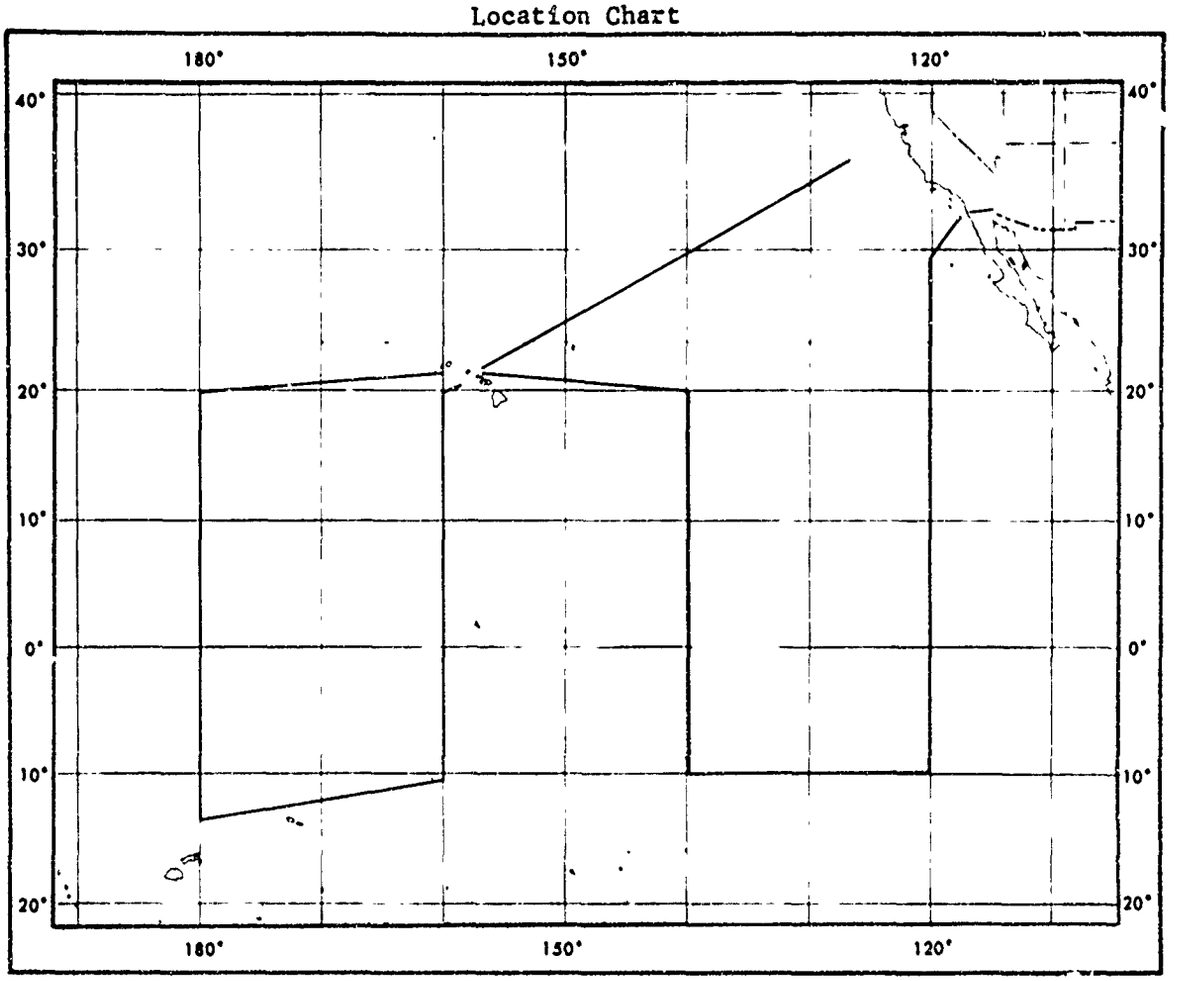
Track Pattern: Single track; 10-mile spacing, N-S, over Trench

Data Format: Profiles of magnetic intensity with regional gradient removed plotted along survey tracks on bathymetric contour chart. Total magnetic intensity contour chart over Aleutian Trench; Profile charts of magnetic intensity and bathymetry.

Reports: Single track data from this survey, combined with surveys 5 and 10, is available in Informal Report M-4-63, "Marine Magnetic Profiles in the Pacific Ocean 1961 - 1962." Contour chart and profiles are contained in Informal Report IR H-3-66, "Geomagnetic Measurements in the North Pacific Ocean Aboard USS REHOBOTH (AGS-50), 1961."

5. Equatorial Pacific Survey

Location Chart



Ship: USS REHOBOTH (AGS-50)

Survey Dates: 25 April - 6 August 1961

Navigational Control: Loran-A, celestial and dead reckoning

Miles Surveyed: 26,000 nautical miles

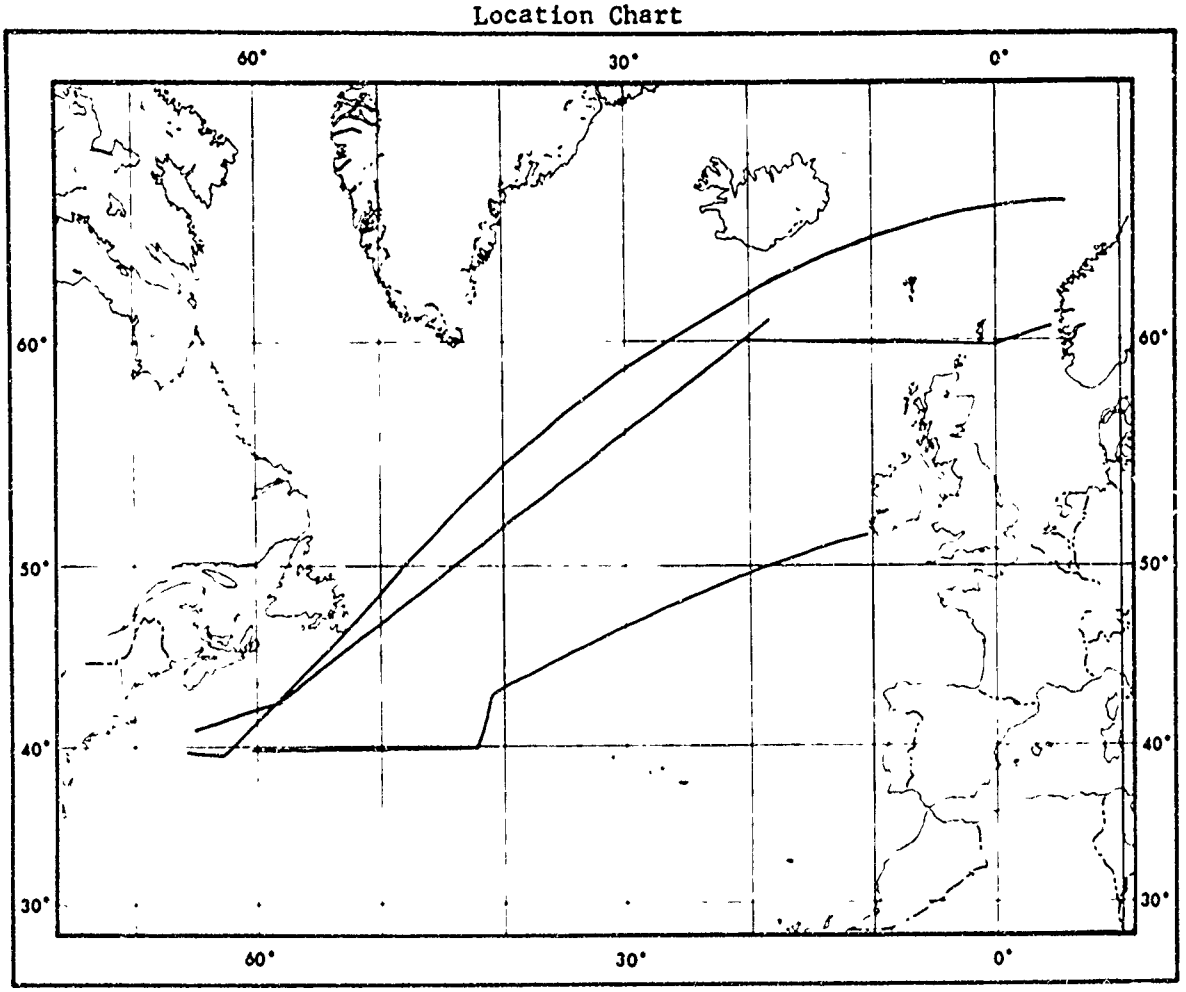
Track Patterns: Single track

Data Format: Profiles of magnetic intensity with regional gradient removed plotted along survey tracks on bathymetric contour charts.

Reports: Information from this survey, combined with surveys 4 and 10, is available in Informal Report M-4-63, "Marine Magnetic Profiles in the Pacific Ocean 1961 - 1962."

6. North Atlantic Survey

Location Chart



Ship: USNS BOWDITCH (T-AGS-21); USNS DUTTON (T-AGS-22); USNS MICHELSON (T-AGS-23)

Survey Dates: 20 November 1961 - 13 March 1962

Navigational Control: Loran-C, Loran-A, Decca, celestial and dead reckoning. Spacing between ships maintained by radar.

Miles Surveyed: 17,200 nautical miles

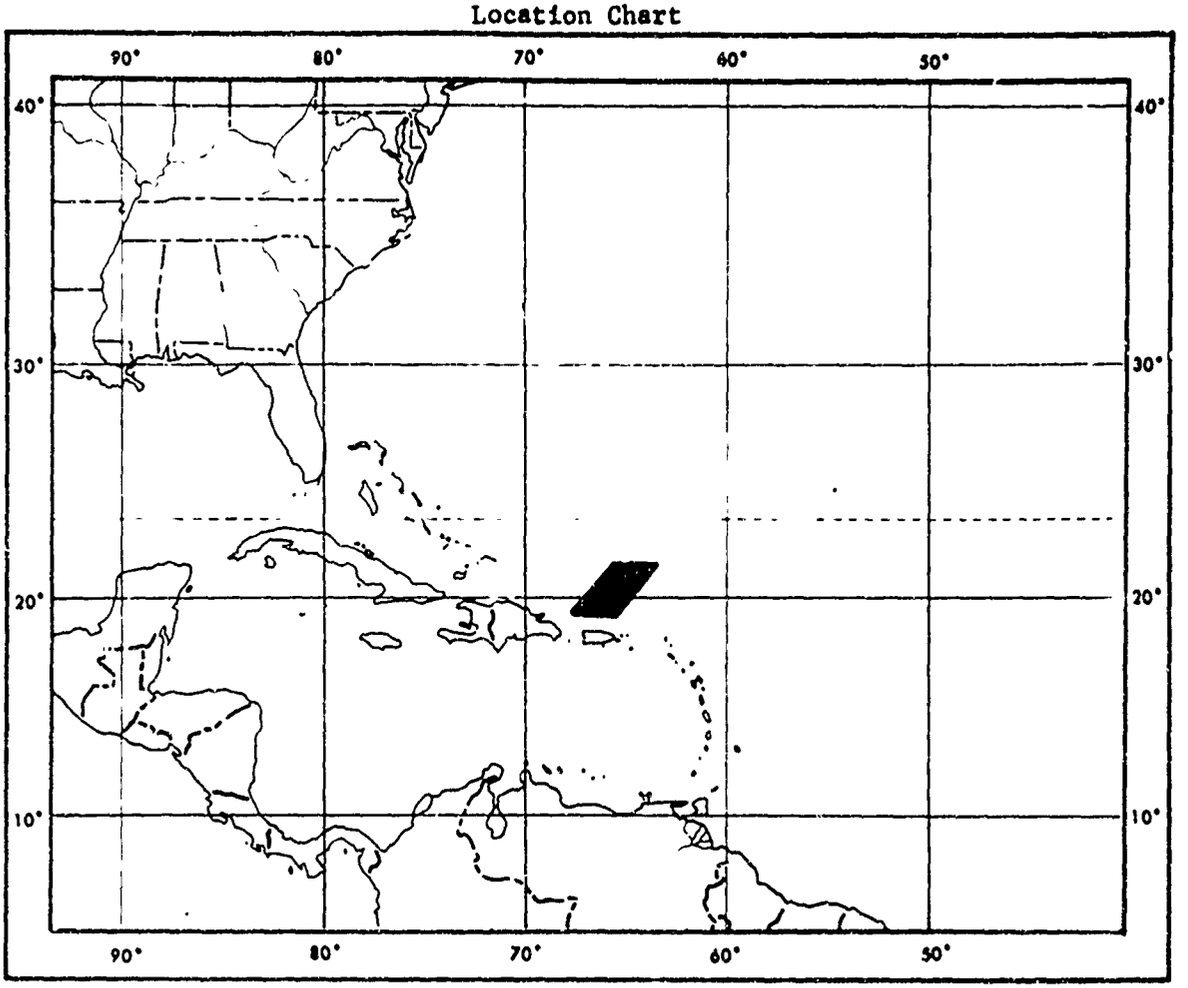
Track Pattern: 10 mile spacing simultaneously

Data Format: Total intensity and bathymetric profiles.

Reports. Technical Report 161, "Geomagnetic and Bathymetric Profiles Across the North Atlantic Ocean."

7. Puerto Rico Trench Survey

Location Chart



Ship: USS PREVAIL (AGS-20)

Survey Dates: 18 February - 31 March 1962

Navigational Control: Loran-A

Miles Surveyed: 20,000 square miles. An additional 2,700 nautical miles of enroute tracks.

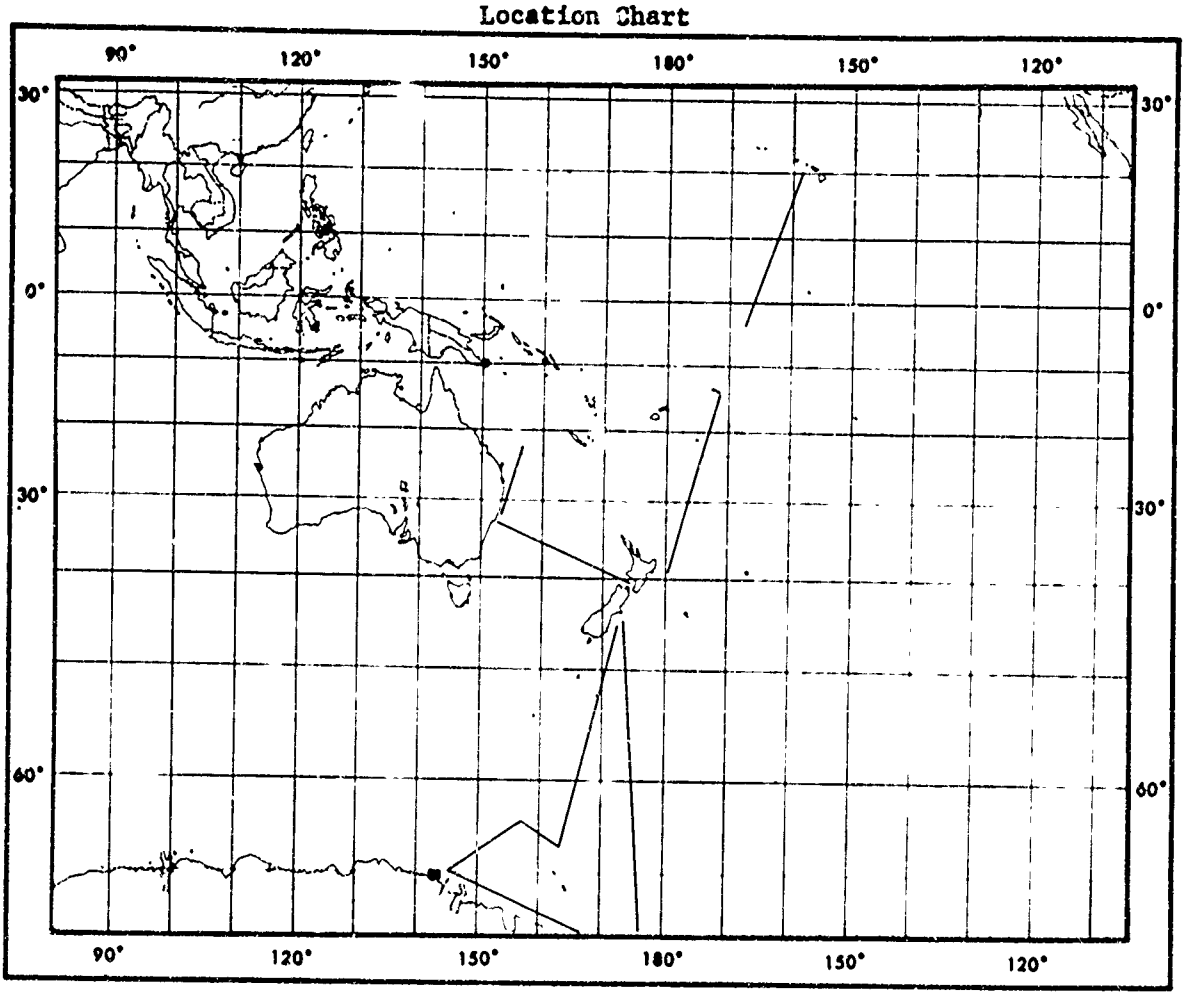
Track Patterns: 5 mile spacing, NE - SW orientation

Data Format: Total and residual intensity contour charts.

Reports: Informal Report M-6-63, "Analysis of Puerto Rico Trench Marine Magnetic Survey Data." A further analysis of these data combined with the data from the airborne Puerto Rico Trench survey is contained in Informal Report H-1-66, "Magnetic Anomalies North of Puerto Rico: Trend Removal with Orthogonal Polynomials." The same report appears in J. Geophys. Res., V. 69, No. 24, 1964.

8. Deep Freeze 1962

Location Chart



Ship: USS BURTON ISLAND (AGB-1)

Survey Dates: 24 October 1961 - 14 March 1962

Navigational Control: Radar, celestial, and dead reckoning

Miles Surveyed: 1,600 square miles in Commonwealth Bay. Additional 10,000 nautical miles of continuous magnetic and bathymetric profiles.

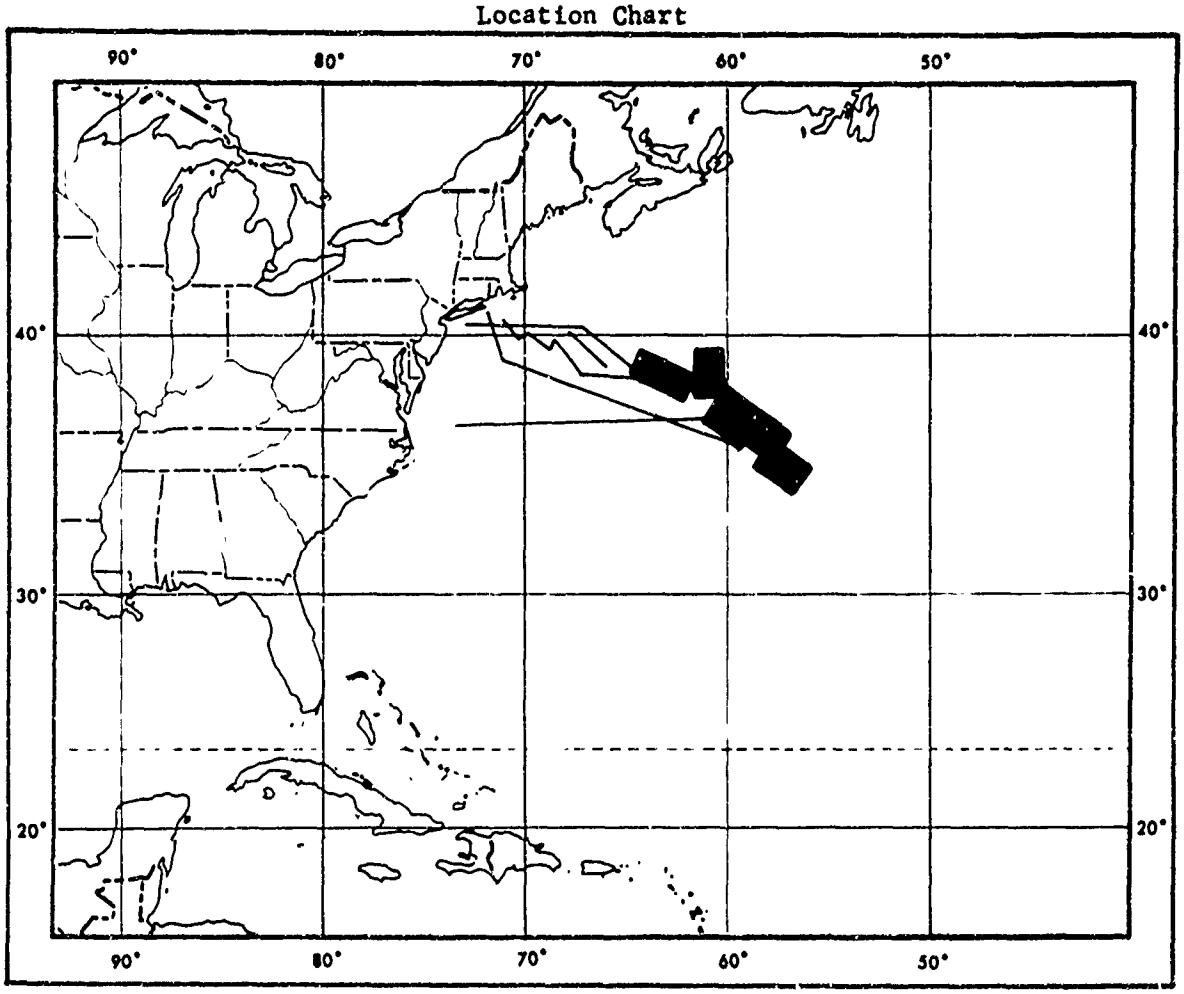
Track Pattern: 5 mile spacing in Commonwealth Bay, N-S orientation

Data Format: Total intensity contour chart of detailed survey area. Data collected along other tracks presented as total intensity and bathymetric profiles.

Reports: Technical Report 118, "Operation Deep Freeze 62, 1961-1962 Marine Geophysical Investigations."

9. New England Seamount Survey

Location Chart



Ship: USS SHELDRAKE (AGS-19)

Survey Dates: 4 June - 14 August 1962

Navigational Control: Loran-A

Miles Surveyed: 30,000 square miles detailed survey area. Additional 2,800 nautical miles of continuous magnetic and bathymetric data collected along enroute tracks.

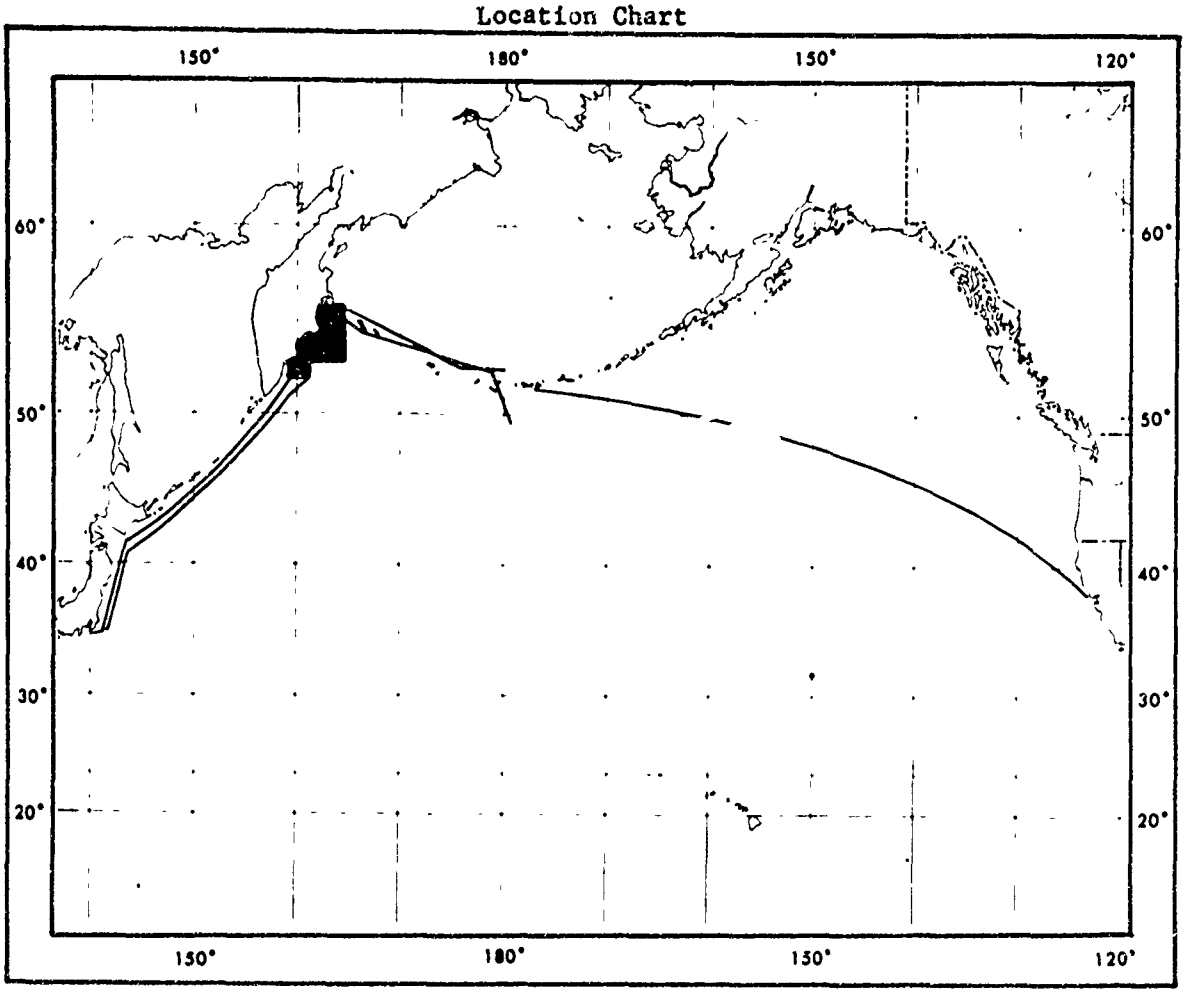
Track Pattern: 5-mile spacing, normal to the seamount chain.

Data Format: Total intensity contour charts. Total intensity and bathymetric profile sheets for five enroute tracks.

Reports: Technical Report 159, "A Marine Magnetic Survey of the New England Seamount Chain;" Informal Report M-8-63, Summary of Magnetization Computations for Kelvin Seamount." A brief article on this survey entitled "A Bathymetric and Geomagnetic Survey of the New England Seamount Chain" also appears in the International Hydrographic Review, Vol. XLI, No. 1, Jan 1964.

10. North Pacific Survey - 1962

Location Chart



Ship: USS REHOBOTH (AGS-50)

Survey Dates: 25 May - 8 September 1962

Navigational Control: Loran-C, radar, celestial, and dead reckoning

Miles Surveyed: 32,500 square miles. Additional 6,732 nautical miles of continuous magnetic profile along enroute tracks.

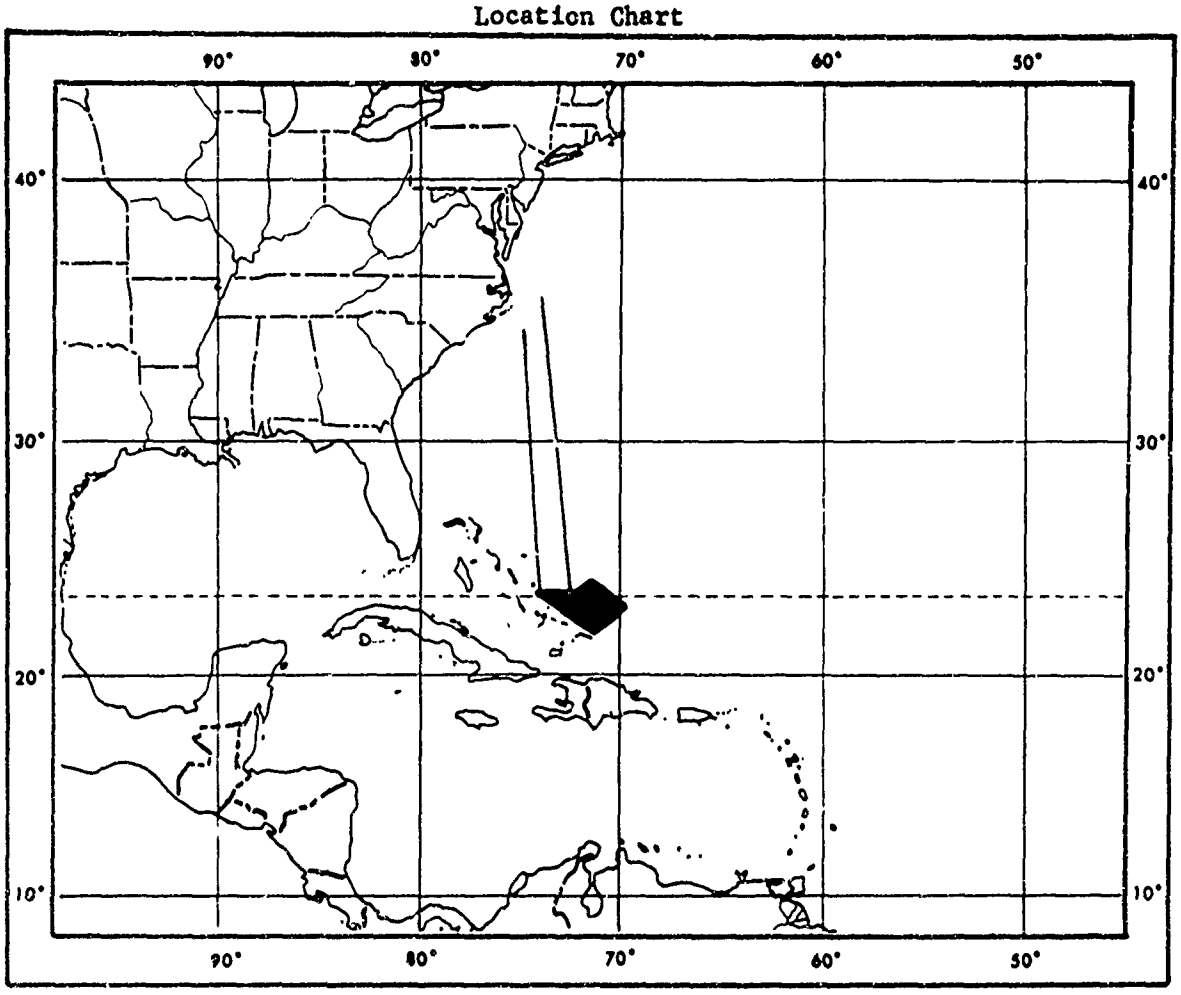
Track Pattern: 5 mile spacing, E-W and NW-SE orientation

Data Format: Total intensity contour charts.

Reports: Technical Report 168, "Marine Magnetic Surveys in the Northwest Pacific Ocean." Profiles of magnetic intensity with regional gradient removed plotted along enroute survey tracks, combined with information from surveys 4 and 5 are presented in Informal Report M-4-65, "Marine Magnetic Profiles in the Pacific Ocean 1961 - 1962."

11. South Bahamas Survey

Location Chart



Ship: USS SHELDRAKE (AGS-19)

Survey Dates: 22 October - 25 November 1962

Navigational Control: Loran-A

Miles Surveyed: 18,000 square miles. Additional 2,350 nautical miles of continuous magnetic and bathymetric profiles along enroute tracks.

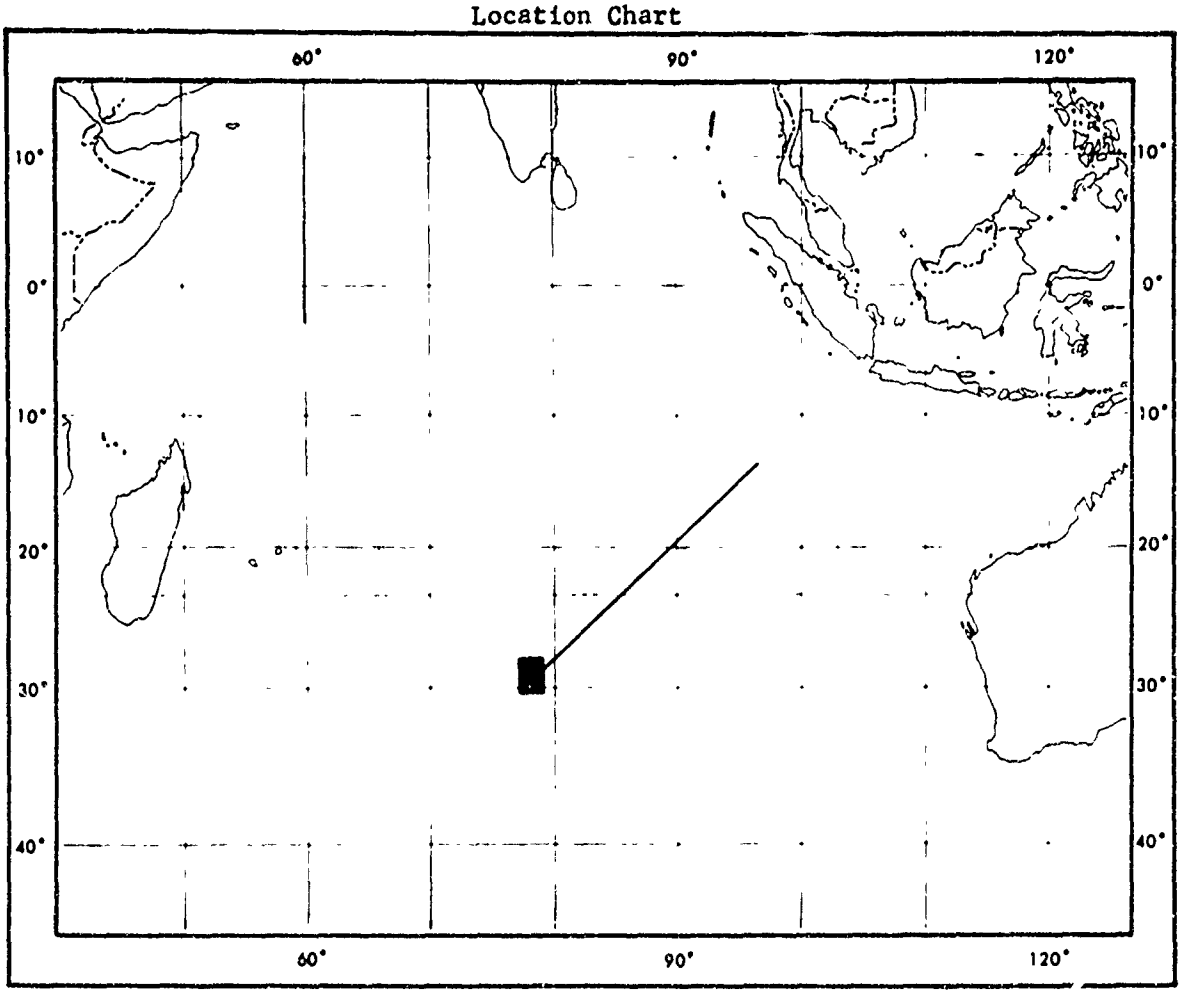
Track Pattern: 5 mile spacing, NE-SW orientation

Data Format: Total and residual intensity contour charts. Data along enroute tracks presented as continuous total intensity and bathymetric profiles.

Reports: Technical Report 160, "Marine Magnetic Survey off the Southern Bahamas." A geologic interpretation of the survey area using an orthogonal polynomial residual intensity contour chart is presented in Informal Manuscript Report M-7-63, "Geologic Interpretation of Marine Magnetic Data in an Area off the Southern Bahama Islands."

12. Indian Ocean Survey

Location Chart



Ship: USNS CORE (T-AKV-41)

Survey Dates: August - December 1962

Navigational Control: Celestial and dead reckoning

Miles Surveyed: 10,000 square miles. Additional 1000 nautical miles of continuous magnetic profile along enroute tracks.

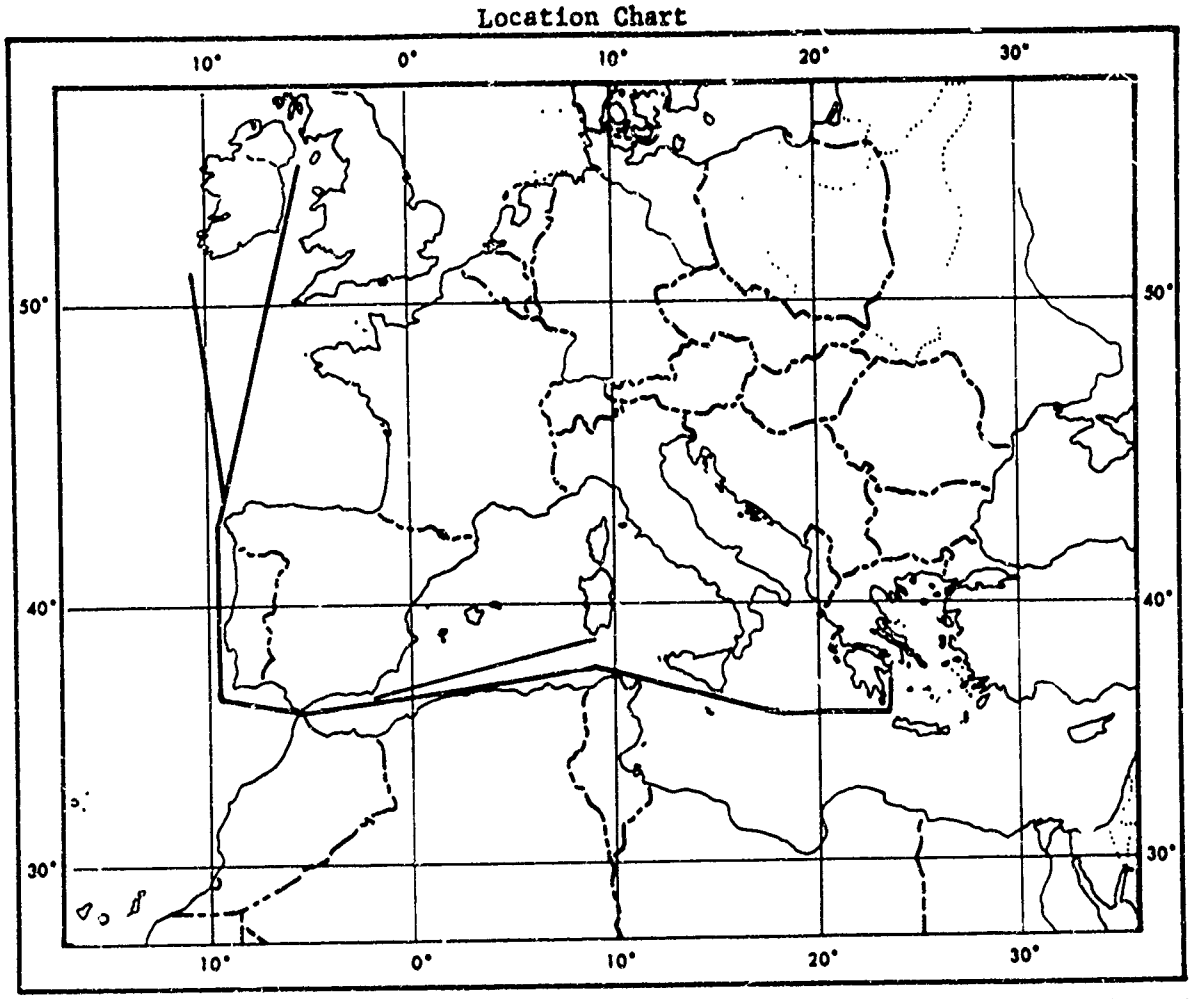
Track Pattern: 5 mile spacing, N-S orientation

Data Format: Total intensity contour chart of the survey area and profiles of enroute magnetic intensity data with regional gradient removed plotted along survey track on bathymetric contour chart.

Reports: Informal Manuscript Report M-9-64, "A Marine Magnetic Survey of an Area in the Central Indian Ocean."

13. Belfast - Piraeus Survey

Location Chart



Ship: USNS BOWDITCH (T-AGS-21), USNS DUTTON (T-AGS-22), USNS MICHELSON (T-AGS-23)

Survey Dates: 5 October - 11 October 1962

Navigational Control: Loran-C, radar, celestial, and dead reckoning

Miles Surveyed: 4,500 nautical miles of survey track

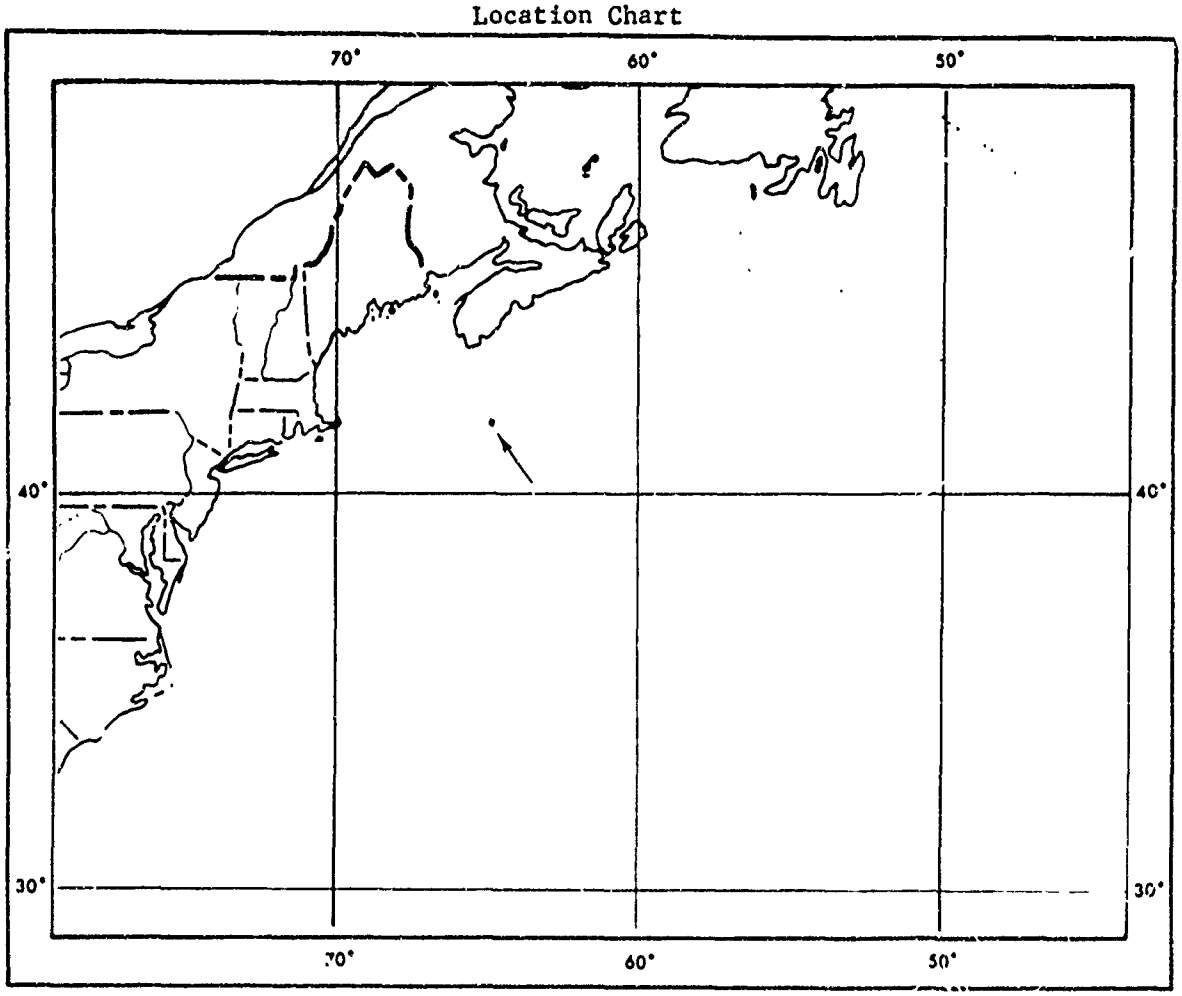
Track Pattern: Single track

Data Format: Continuous magnetic-bathymetric-gravimetric profiles.

Reports: Informal Report H-2-66, "Geophysical Profiles in the Northeastern Atlantic Ocean and the Mediterranean Sea, 1962-1963."

14. Thresher Search

Location Chart



Ship: USNS GILLISS (AGOR-4)

Survey Dates: April - August 1963

Navigational Control: Loran-A, Loran-C

Miles Surveyed: Approximately 7 square mile area with magnetometer sensor at depths exceeding 8,000 feet.

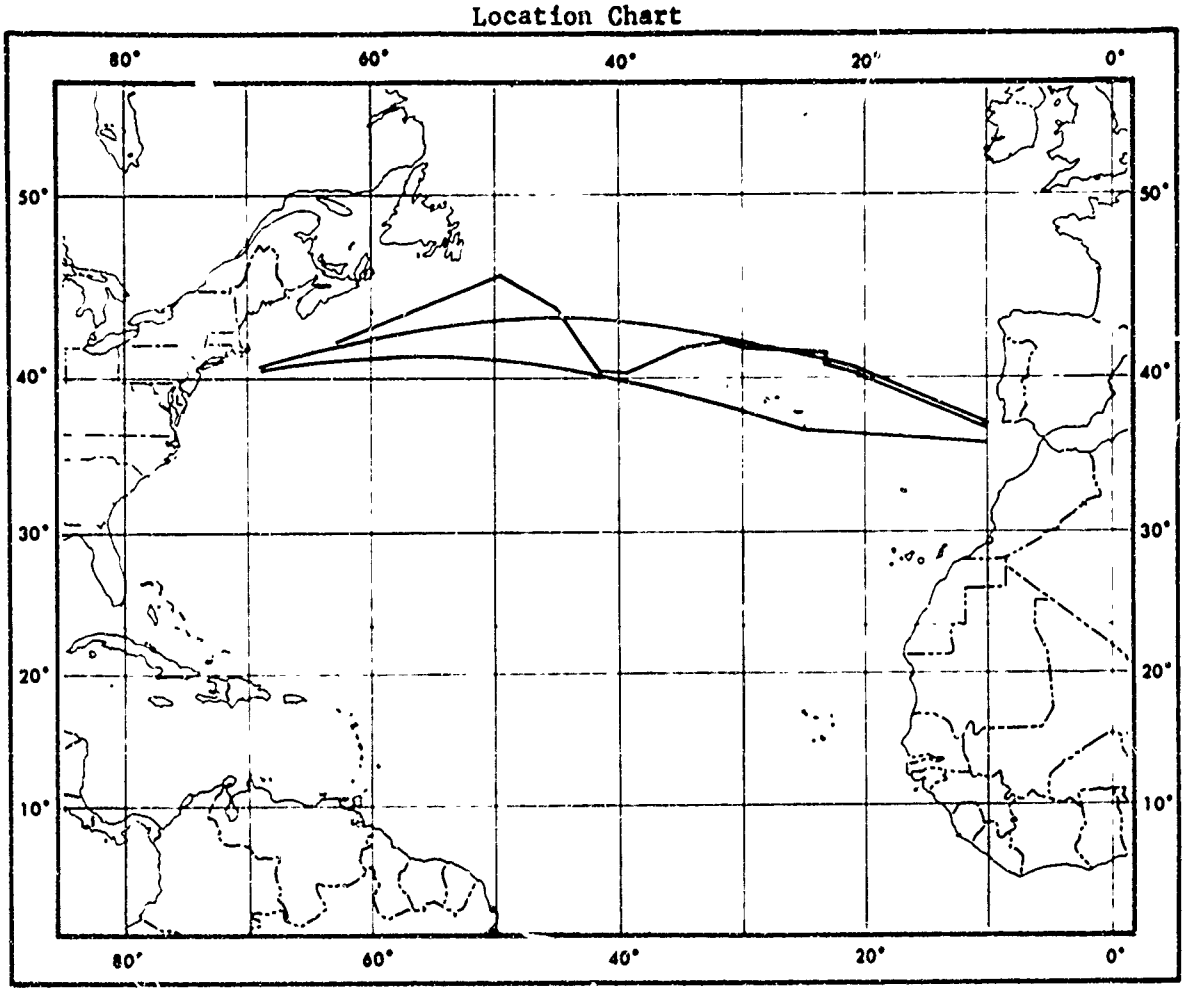
Track Pattern: Irregular

Data Format: Total intensity contour chart.

Reports: Informal Report M-2-64, "A Deep-Towed Magnetometer System." Describes development and design of a deep-towed magnetometer system and its subsequent use in search operations.

15. Atlantic Crossings, Gibraltar to New York

Location Chart



Ship: USNS MICHELSON (T-AGS-23), USNS BOWDITCH (T-AGS-21), USNS DUTTON (T-AGS-22)

Survey Dates: August, September 1963, February 1964

Navigational Control: Loran-C, Loran-A, celestial, and dead reckoning

Miles Surveyed: Approximately 10,000 miles of survey track.

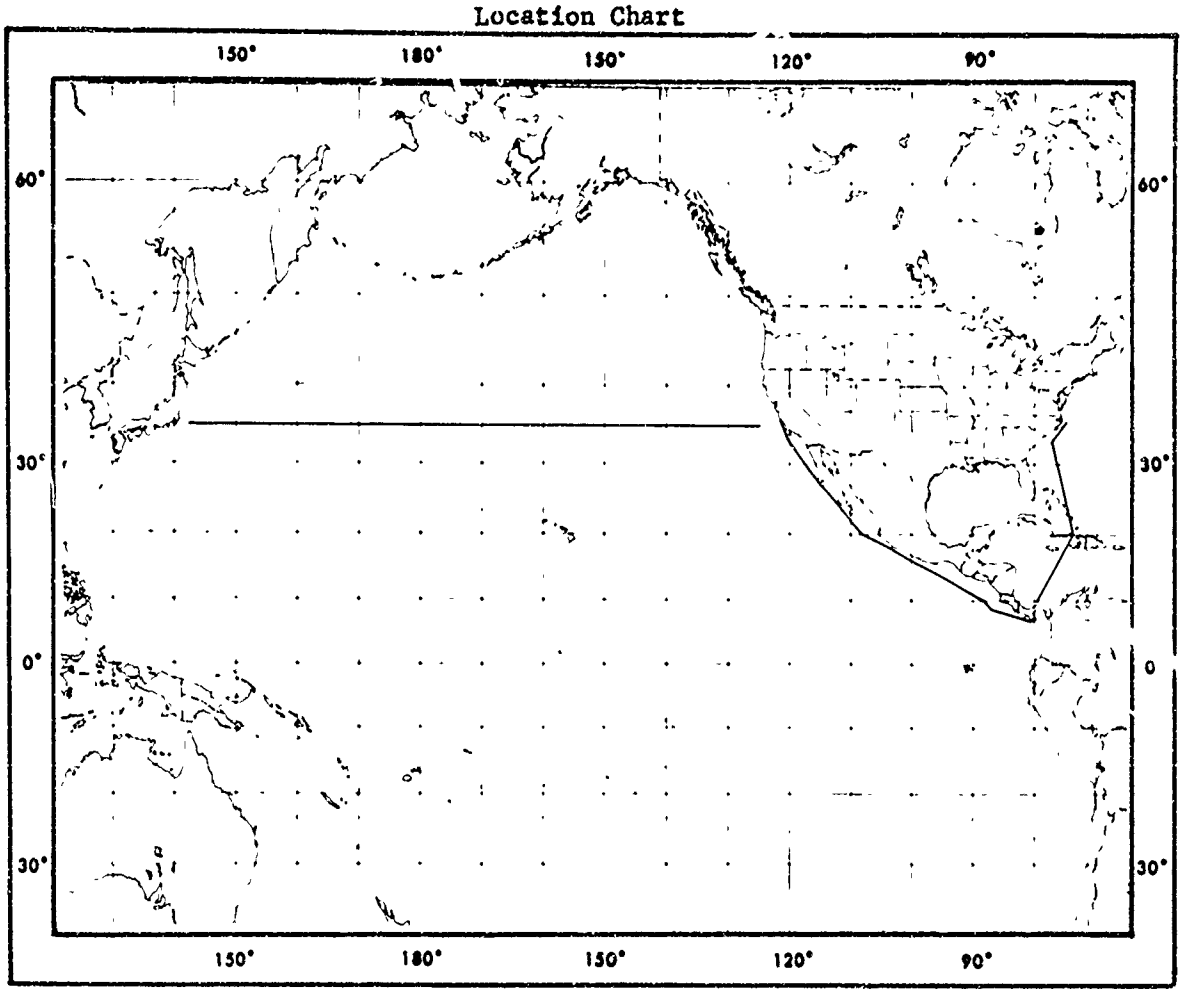
Track Pattern: Single track

Data Format: Total intensity data plotted at 50 gamma intervals, maxima and minima, on 1:500,000 scale Transverse Mercator Projections.

Reports: Informal Report No. 69-68, "Geomagnetic Profiles, Gibraltar to New York 1963 - 1964."

16. Ocean Track, New York to Tokyo

Location Chart



Ship: USNS BOWDITCH (T-AGS-21)

Survey Dates: 27 October - 26 November 1963

Navigational Control: Loran-C, Loran-A, celestial, and dead reckoning

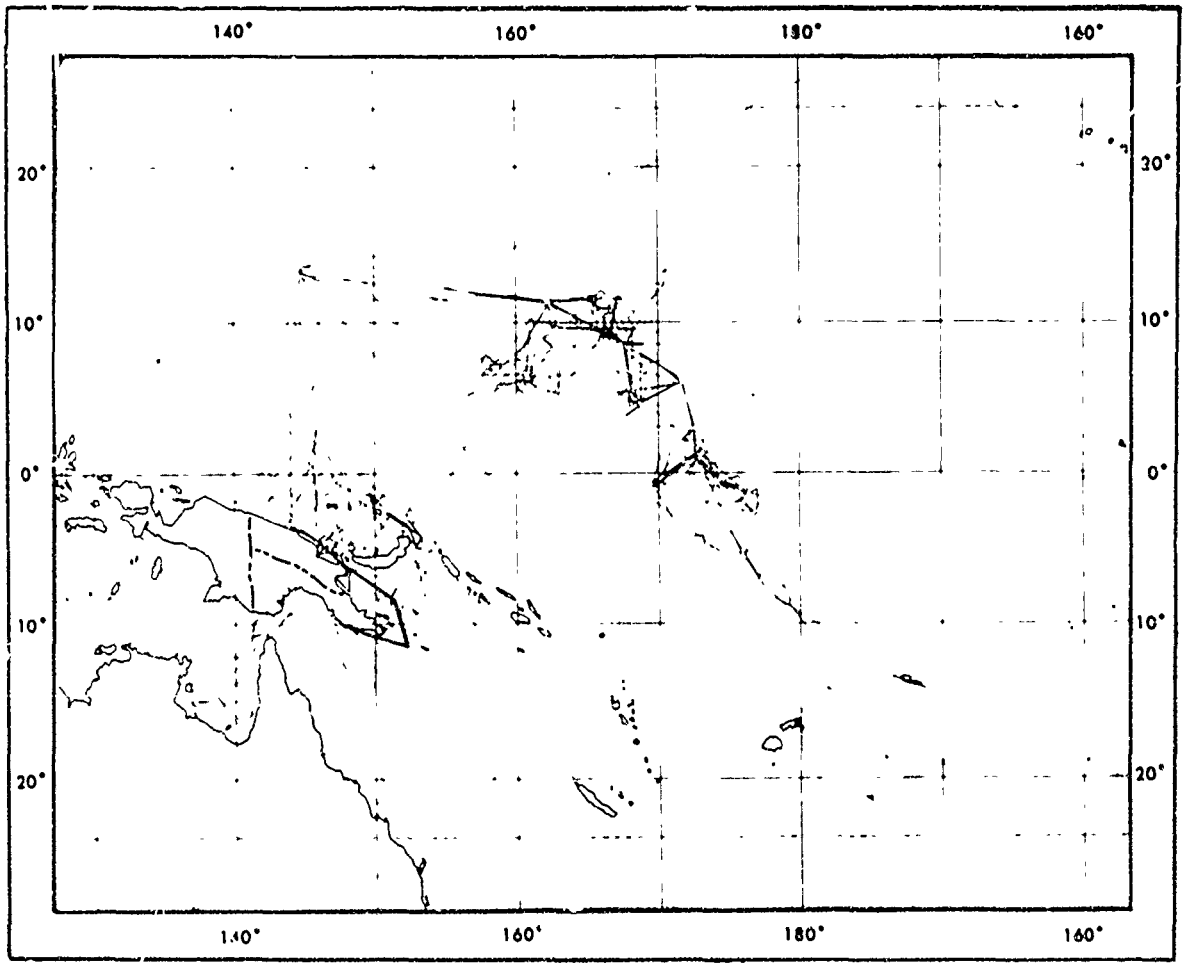
Miles Surveyed: Approximately 10,700 miles enroute survey track via Panama Canal and San Francisco.

Track Pattern: Single track

Data Format: Total intensity data plotted at 50 gamma intervals, maxima and minima, on 1:500,000 scale Transverse Mercator Projections. Preliminary magnetic and bathymetric profiles with plot of ship's track available at approximately 1:1,400,000 scale.

17. Southwest Pacific Survey

Location Chart



Ship: USNS SGT CURTIS F. SHOUP (T-AG-175)

Survey Dates: 18 May 1963 - 1 November 1965

Navigational Control: Loran-A, radar, celestial, and dead reckoning

Miles Surveyed: 78,500 miles enroute survey track

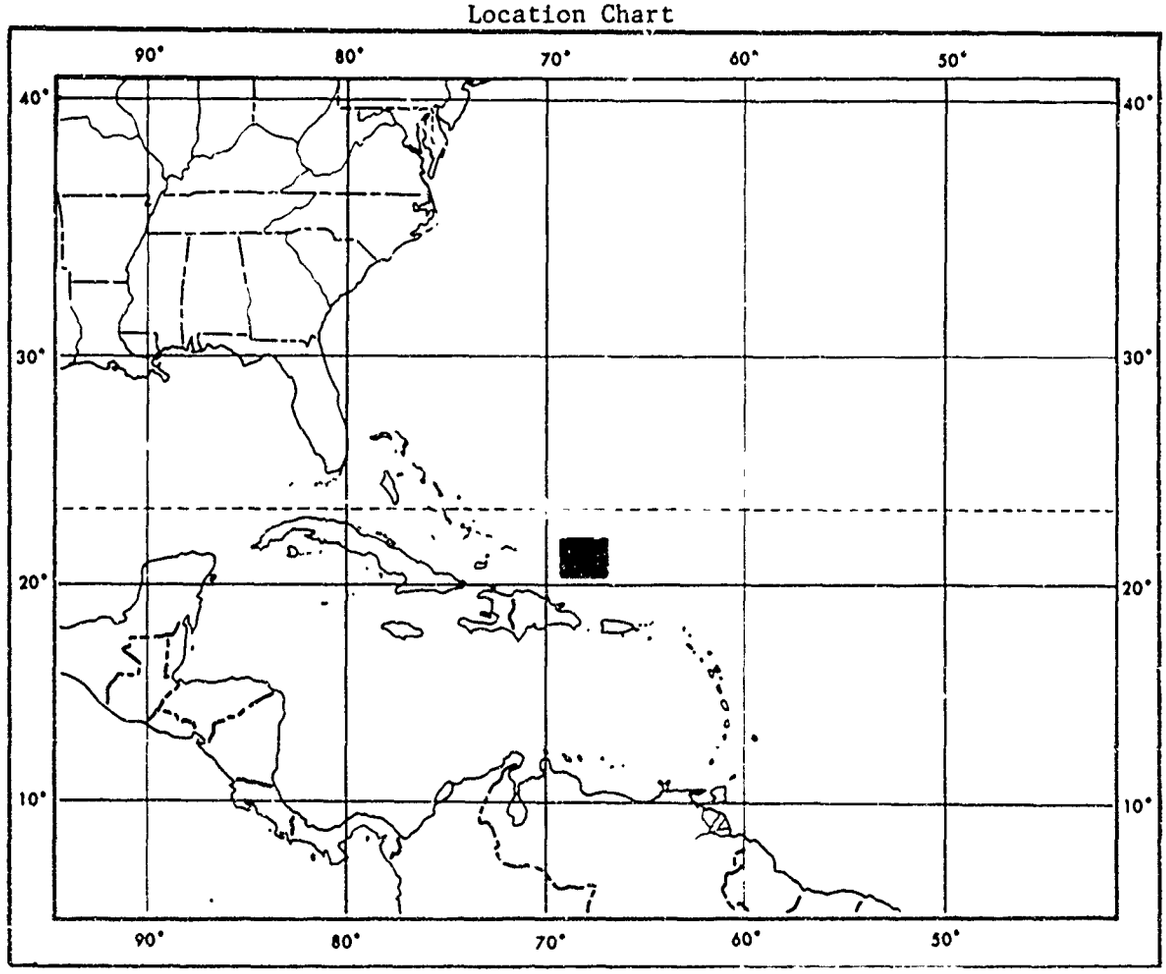
Track Pattern: Irregular

Data Format: Total intensity data plotted at 50 gamma intervals, maxima and minima, on 1:500,000 scale Transverse Mercator Projections. Copies of the total magnetic intensity analog traces for the Southwest Pacific Survey are available on microfilm (see Section III-C).

Reports: Brochure containing a chart index and a description of the survey operations.

18. Hispaniola Survey

Location Chart



Ship: USACS A. J. MYER

Survey Dates: 26 March - 15 April 1964

Navigational Control: Loran-C and Loran-A

Miles Surveyed: 11,000 square miles

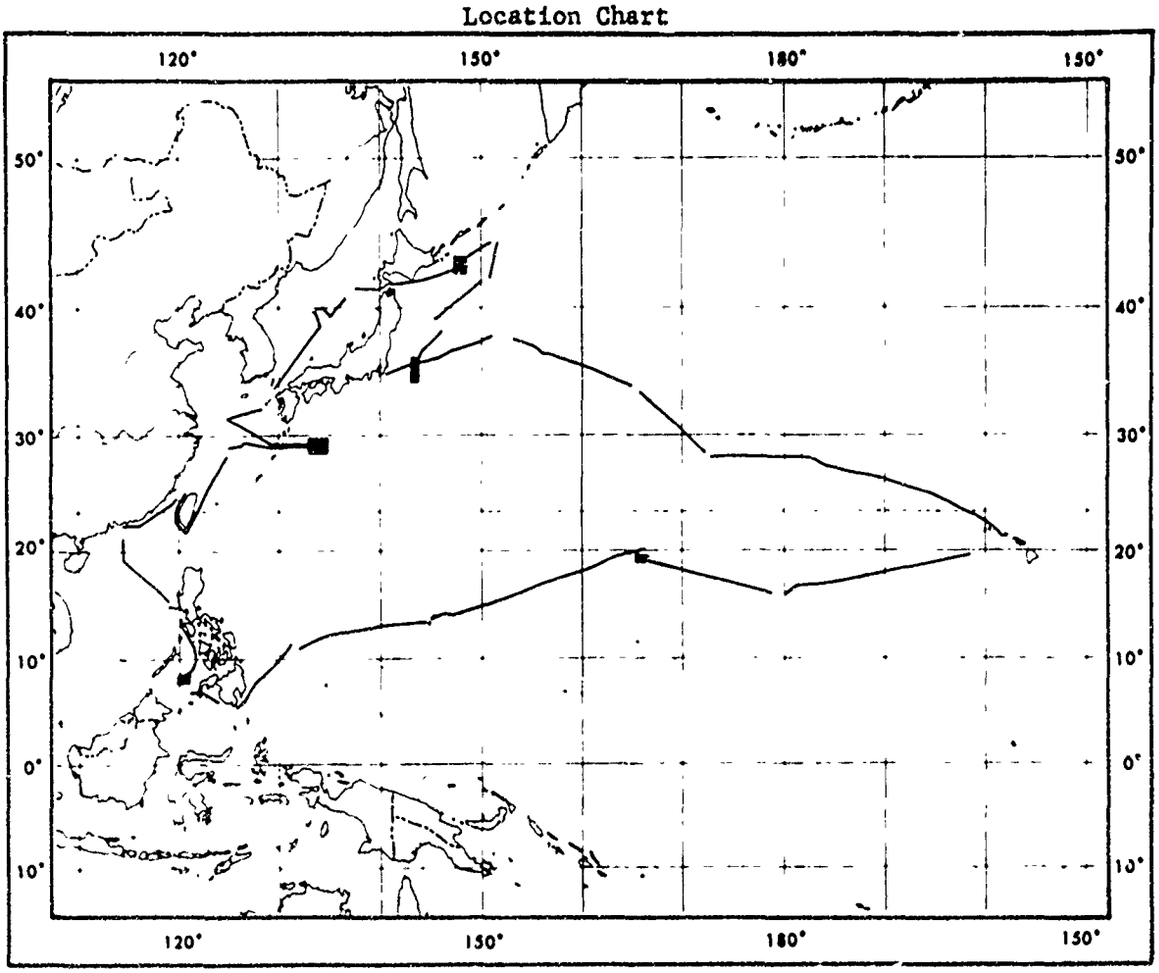
Track Pattern: 3 mile spacing, E-W orientation

Data Format: Total and residual intensity contour charts.

Reports: IR H-1-65, "Geomagnetic Survey of an Area Northeast of Hispaniola."

19. Western Pacific (Reconnaissance) Survey 1964

Location Chart



Ship: USNS DAVIS (AGOR-5)

Surv Dates: May - September 1964

Navigational Control: Radar and visual within range of land; Loran-A, celer ial, and dead ·eckoning on most tracks.

Miles Surveyed: 13,500 nautical miles; an additional 7,600 square-mile coverage in 5 survey areas.

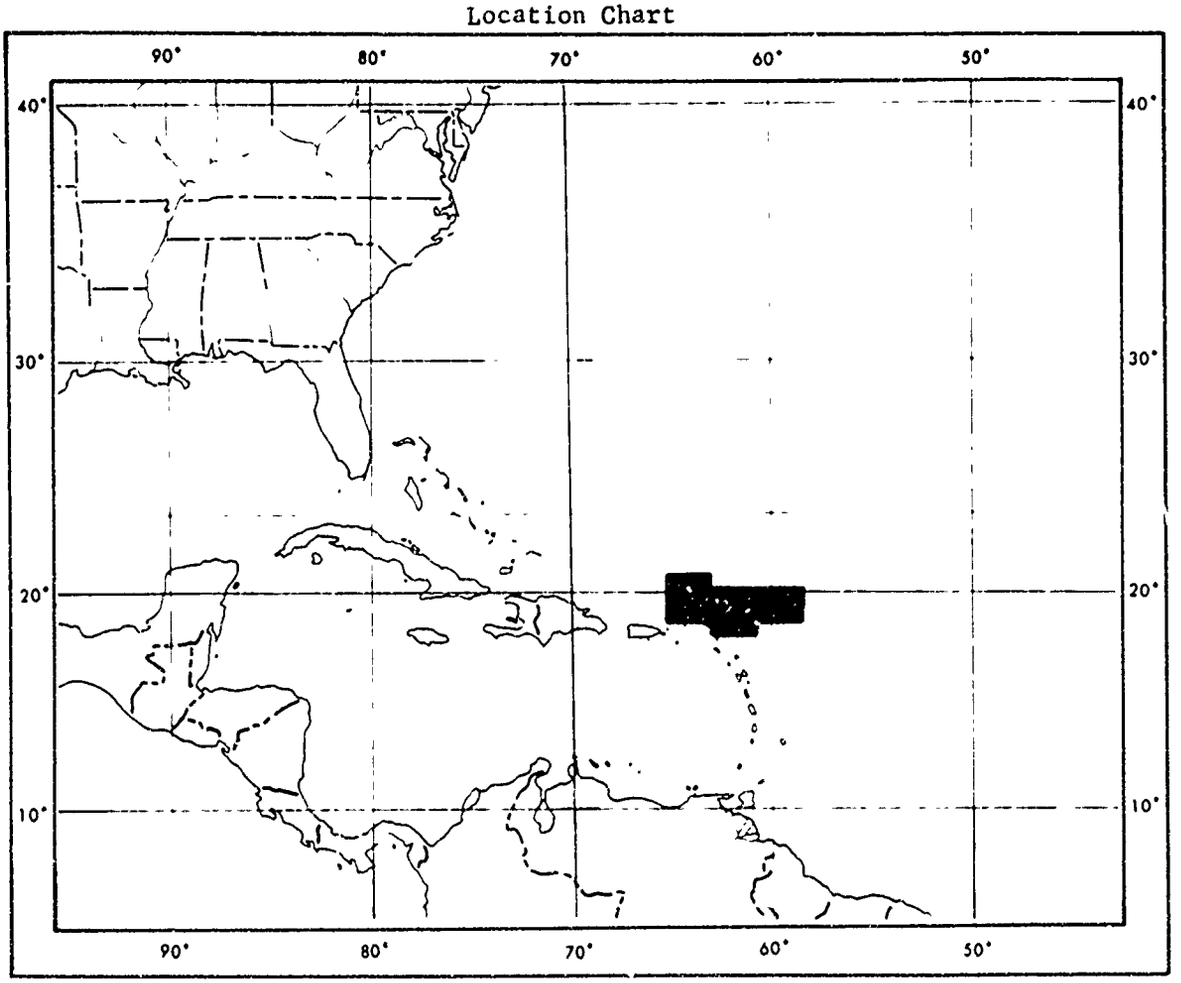
Track Pattern: Single track; 5-10 mile spacing, N-S or NE-SW in survey areas.

Data Format: Total intensity and bathymetric contour charts; profile charts of magnetic intensity and bathymetry with ship's track.

Reports: Contour charts and profiles are presented in Informal Report H-4-66, "Geomagnetic Measurements in the Pacific Ocean Aboard USNS CHARLES H. DAVIS (AGOR 5), 1964."

20. Antilles Atlantic Ocean Surveys

Location Chart



Ship: USACS A. J. MYER

Survey Dates: September - December 1964

Navigational Control: Lambda-Decca

Miles Surveyed: 41,000 square miles

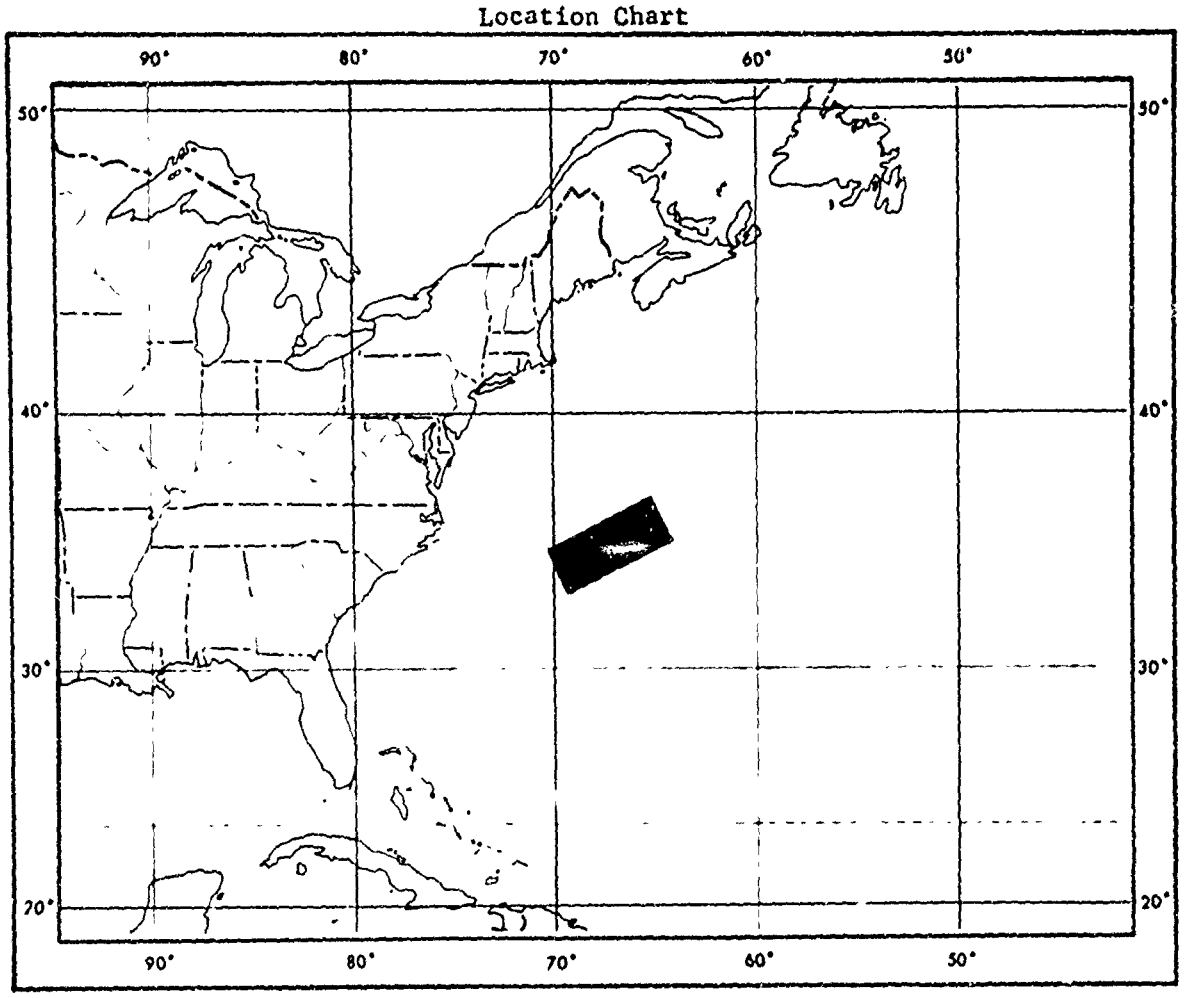
Track Pattern: 3 mile spacing; part N-S, part E-W orientation

Data Format: Total and residual intensity contour charts.

Reports: IR H-5-66, "Shipboard Magnetic Survey of an Area North of the Lesser Antilles."

21. Area Northwest of Bermuda (Reconnaissance) Survey

Location Chart



Ship: USNS GILLISS (AGOR-4)

Survey Dates: November - December 1964

Navigational Control: Loran-A, celestial, dead-reckoning

Miles Surveyed: 30,000 square miles

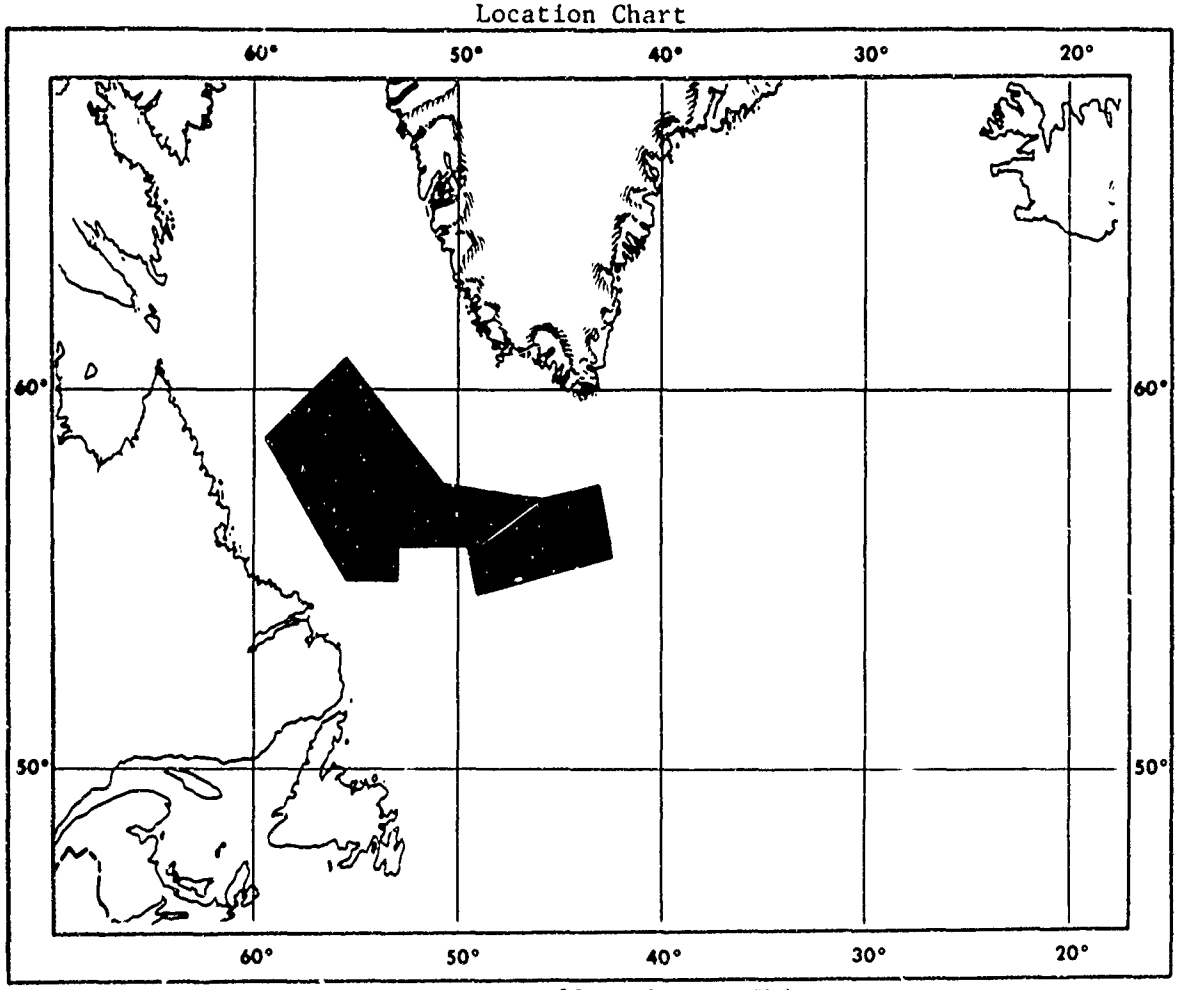
Track Pattern: Northwest-Southeast, 30-mile spacing

Data Format: Total intensity data plotted at 50-gamma intervals, maxima and minima, on 1:500,000 scale Transverse Mercator Projections; total magnetic intensity contour chart showing general magnetic characteristics.

Reports: Informal Report H-6-66, "Shipboard Magnetic Survey of an Area Northwest of Bermuda."

22. Labrador Sea Survey

Location Chart



Ship: Various Naval Oceanographic Office Survey Ships

Survey Dates: 1966

Navigational Control: Loran C

Miles Surveyed: 87,000 square miles

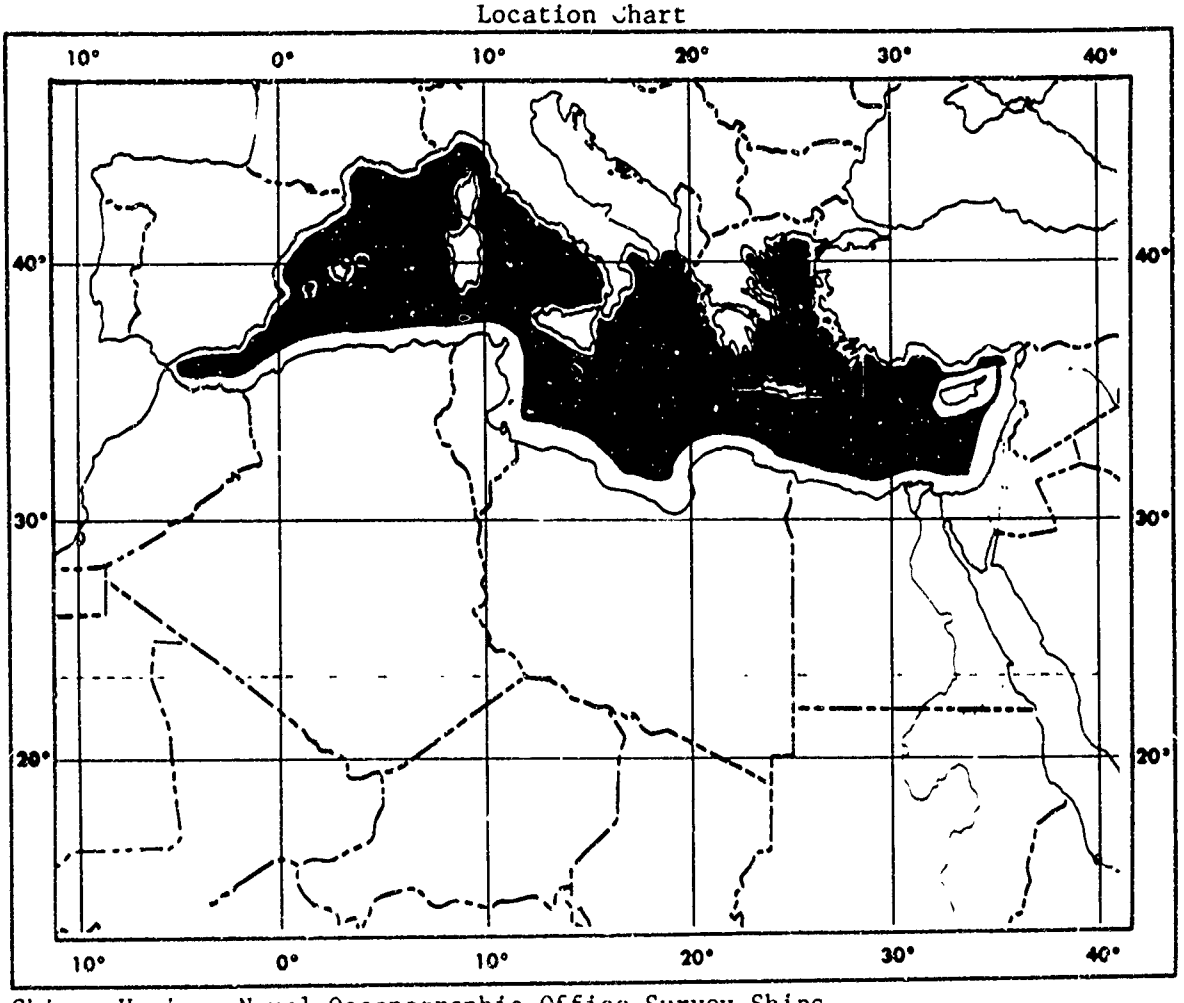
Track Pattern: 5 mile spacing, SW-NE orientation in southeastern section. 10 mile spacing, E-W orientation and NW-SE orientation in rest of area.

Data Format: Data are being processed and analyzed, but are not yet available for distribution. Information on this survey is provided to avoid duplication of survey effort. Notification of data availability will be made at a later date. Total and residual intensity charts at 50-gamma contour intervals on mercator projections at a scale of 1° longitude = 4 inches are planned.

Reports: Paper titled, "Morphology, Magnetic Anomalies and Evolution of the Northeast Atlantic and Labrador Sea - Part I-Morphology, Part II-Magnetic Anomalies, and Part III-Evolution," presented at April 1969 meeting of the American Geophysical Union. Scientific papers containing charts, analyses, and interpretation will be submitted to professional journals.

23. Mediterranean Sea Survey

Location Chart



Ship: Various Naval Oceanographic Office Survey Ships

Survey Dates: 1966-1968

Navigational Control: Loran C, satellite

Miles Surveyed: Approximately 600,000 square miles

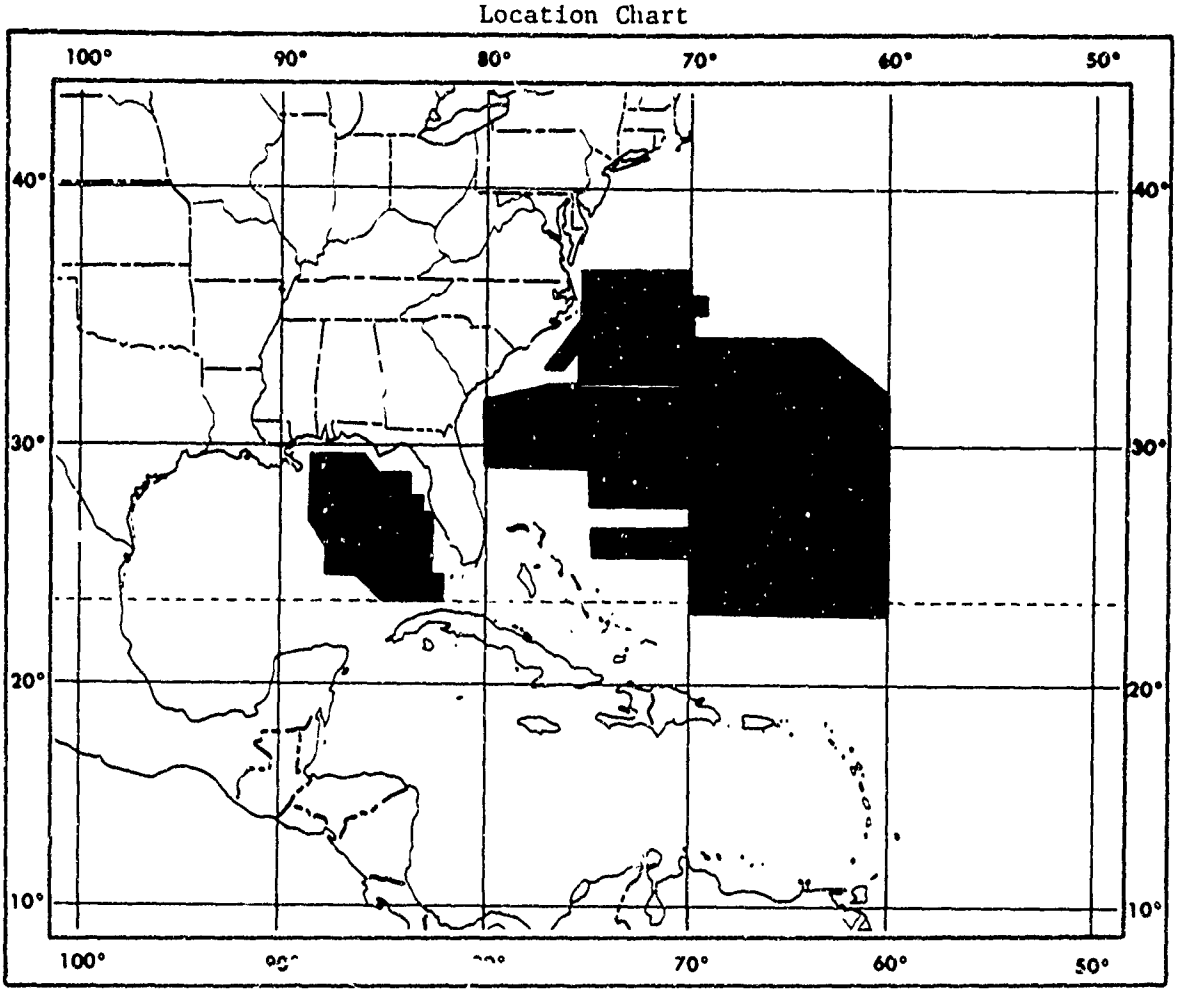
Track Pattern: 5 mile spacing, E-W orientation with random cross-checks in Aegean Sea. 10 mile spacing, E-W orientation with random cross-checks in rest of area.

Data Format: Data are being processed and analyzed, but are not yet available for distribution. Information on this survey is provided to avoid duplication of survey effort. Notification of data availability will be made at a later date. Total and residual intensity charts at 50-gamma contour intervals on mercator projections at a scale of 1° longitude = 4 inches are planned.

Reports: Scientific papers containing data, analyses, and interpretation will be submitted to professional journals.

24. Eastern Gulf of Mexico and North American Basin Survey

Location Chart



Ship: Various Naval Oceanographic Office Survey Ships

Survey Dates: 1967-1968

Navigational Control: Loran C, Lorac, Loran A, satellite

Miles Surveyed: 630,000 square miles

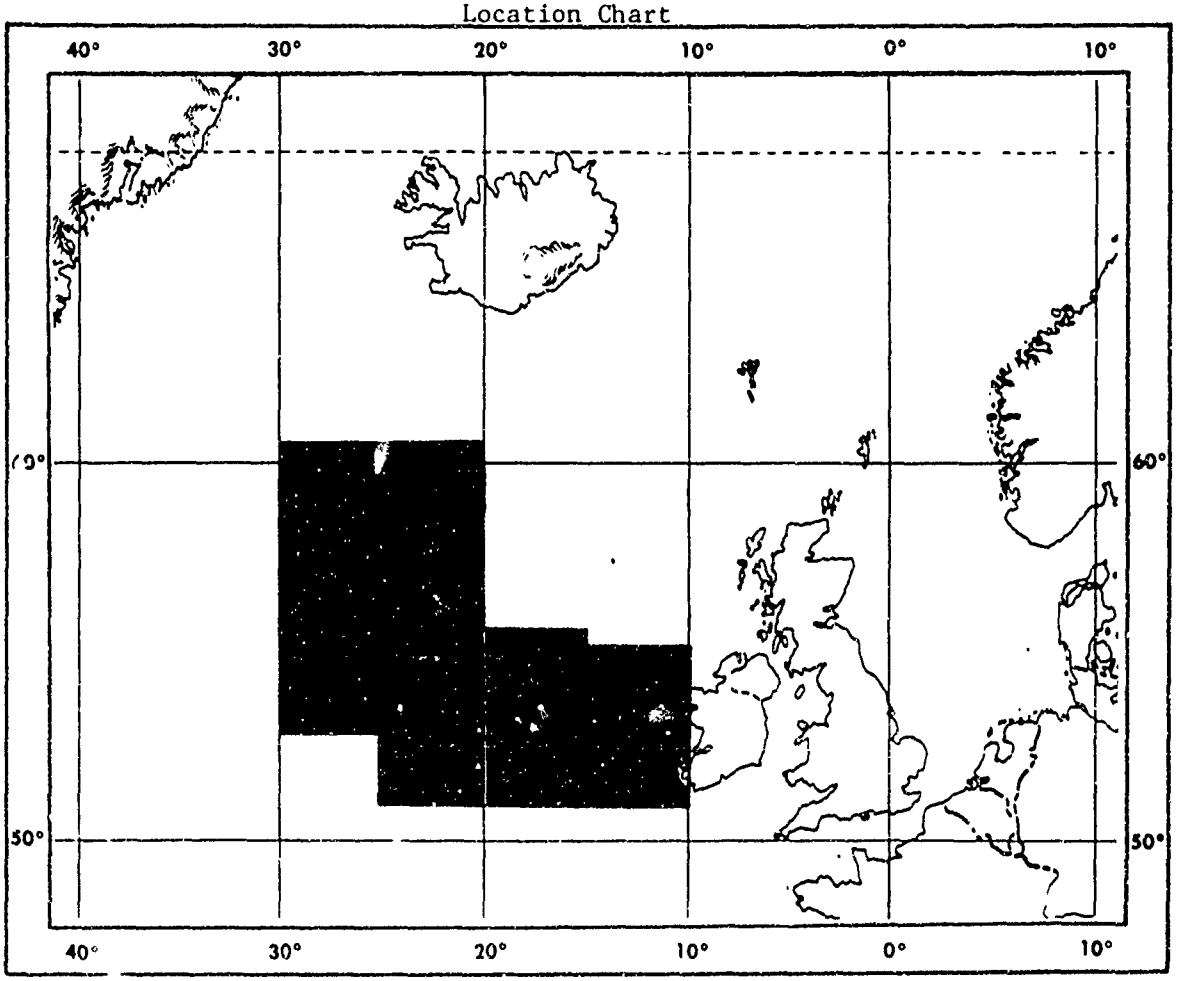
Track Pattern: 10 mile spacing, E-W orientation with random cross-checks in Gulf of Mexico and the area south of 32°N latitude and adjacent to the East Coast of the U.S. 20 mile spacing, E-W orientation with random cross-checks in the rest of the area.

Data Format: Data are being processed and analyzed, but are not yet available for distribution. Information on this survey is provided to avoid duplication of survey effort. Notification of data availability will be made at a later date. Total and residual intensity charts at 50-gamma contour intervals on mercator projections at a scale of 1° longitude = 4 inches are planned for the 10 mile spacing areas. Residual profiles are planned for the 20 mile spacing area.

Reports: Paper titled, "Magnetic Anomaly Trends Between Bermuda and the Bahama Antilles Arc," presented at April 1969 meeting of the American Geophysical Union. Scientific papers containing charts, analyses, and interpretation in preparation.

25. Northeast Atlantic Survey

Location Chart



Ship: Various Naval Oceanographic Office Survey Ships

Survey Dates: 1967-1969

Navigational Control: Loran C, satellite

Miles Surveyed: 325,000 square miles

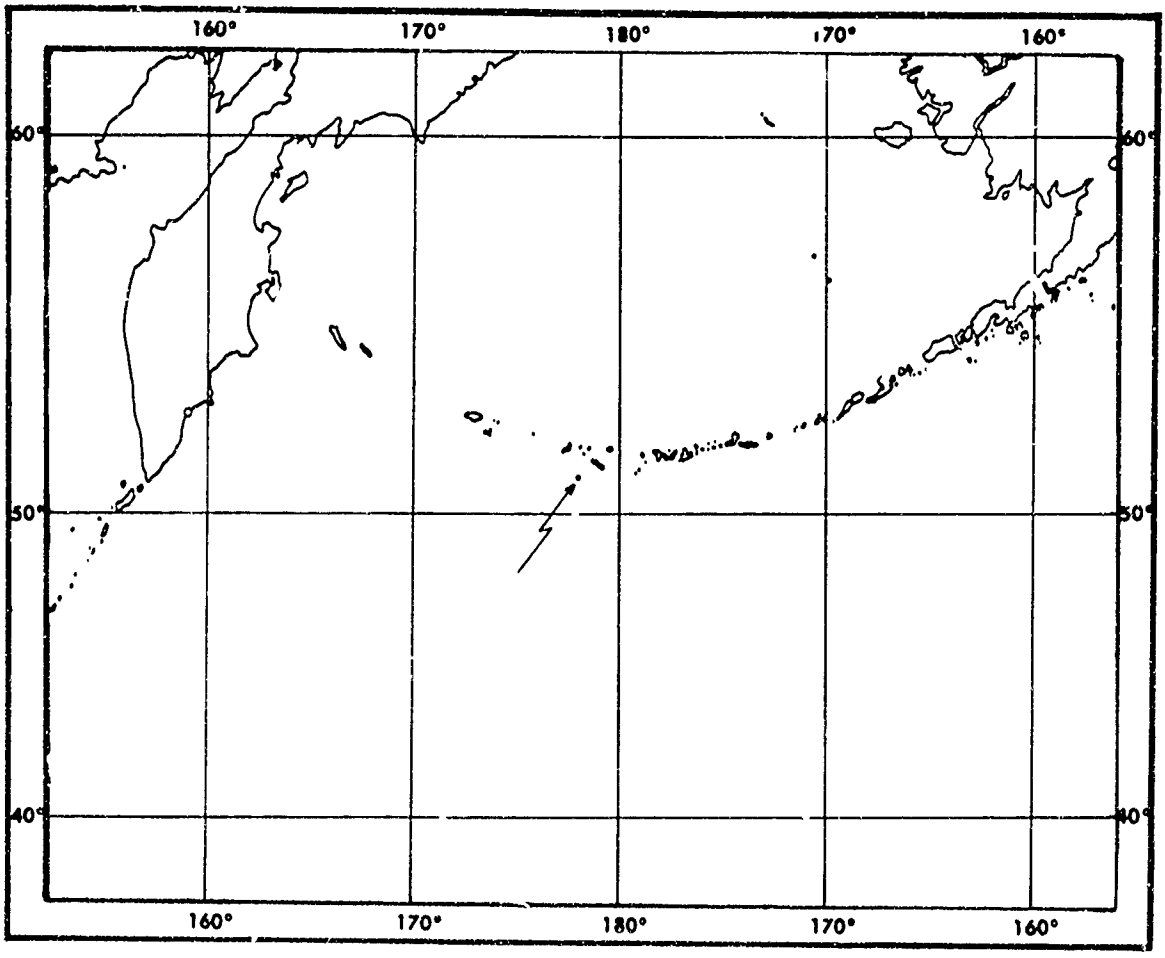
Track Pattern: 3 mile spacing, E-W orientation with N-S cross-checks at 15-30 mile spacing. Area from 51°N to 56°N latitude and between 10°W and 20°W longitude; 6 mile spacing, E-W orientation, random N-S cross-checks.

Data Format: Data are being processed and analyzed, but are not yet available for distribution. Information on this survey is provided to avoid duplication of survey effort. Notification of data availability will be made at a later date. Total and residual intensity charts at 50-gamma contour intervals on mercator projections of a scale of 1° longitude = 4 inches are planned.

Reports: Paper titled, "Morphology, Magnetic Anomalies and Evolution of the Northeast Atlantic and Labrador Sea - Part I-Morphology, Part II-Magnetic Anomalies, and Part III-Evolution," presented at April 1969 meeting of the American Geophysical Union. Scientific papers containing charts, analyses, and interpretation will be submitted to professional journals.

26. R.L. STEVENSON Search

Location Chart



Ship: USNS BENT

Survey Dates: August - September 1967

Navigational Control: Loran-C and dead reckoning

Miles Surveyed: 5.3 square miles

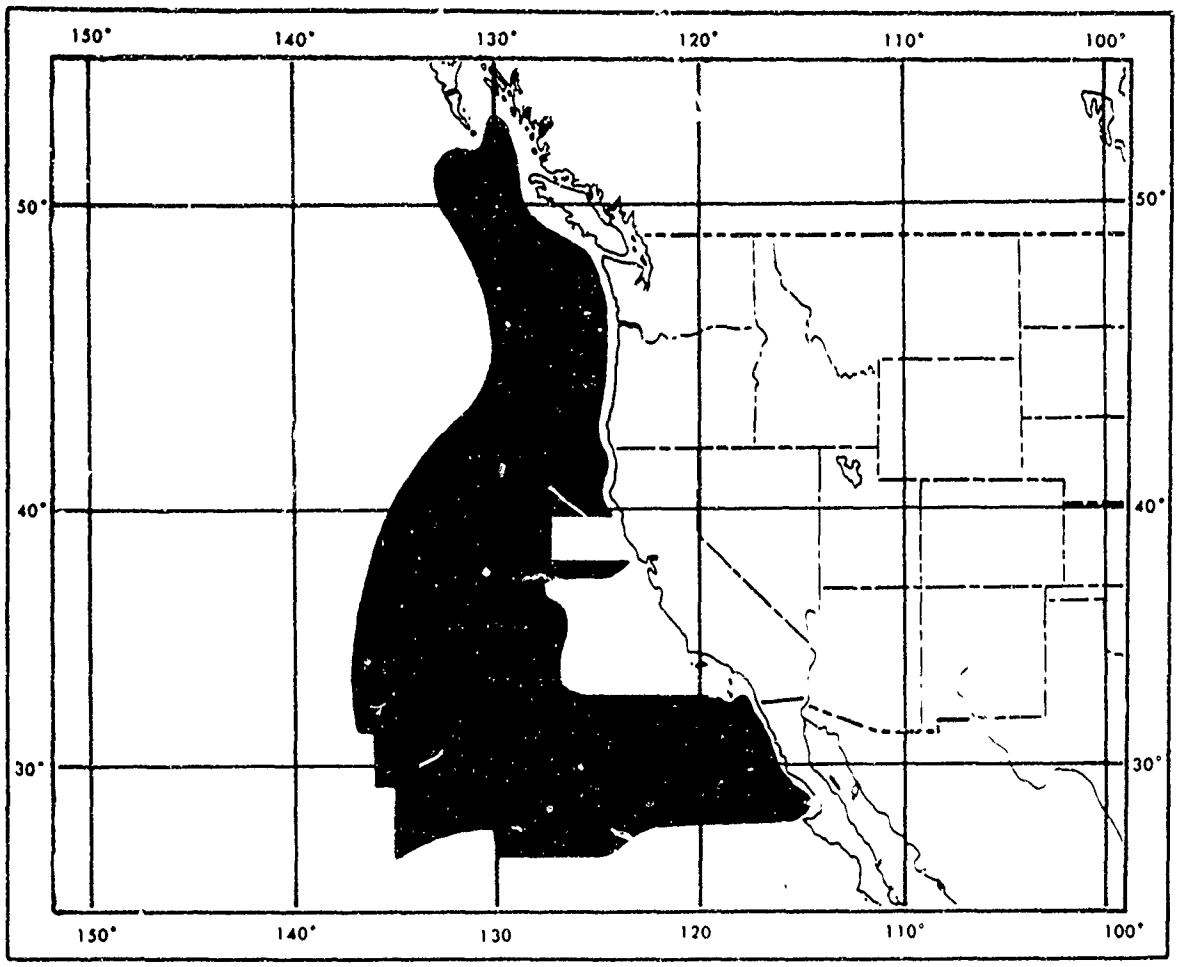
Track Pattern: Tracks vary in spacing and orientation

Data Format: Total magnetic intensity and bathymetric contour charts; magnetic and sonar profiles.

Reports: SP-120, "Chase VI Search Operations."
F. M. Daugherty, Jr. and Jerry C. Carroll. Search for the STEVENSON, Under Sea Technology, Vol. 9, No. 4, April 1968.

27. U. S. Pacific Coast Survey

Location Chart



Ship: Various Naval Oceanographic Office Survey Ships

Survey Dates: 1969

Navigational Control: Satellite

Miles Surveyed: 550,000 square miles

Track Pattern: 20 mile spacing, E-W orientation with random cross-checks

Data Format: Data are being processed and analyzed, but are not yet available for distribution. Information on this survey is provided to avoid duplication of survey effort. Notification of data availability will be made at a later date.

Reports: Scientific papers containing analyses and interpretation will be submitted to professional journals.

PROJECT MAGNET

Among the more significant of the U. S. Naval Oceanographic Office's geophysical surveys is Project MAGNET, the world-wide airborne geomagnetic survey. This survey normally employs two aircraft equipped with vector airborne magnetometers which measure the intensity and direction of the earth's magnetic field. The normal data output for the VAM-2 is continuous total magnetic intensity and periodic vector magnetic data spaced at five minute (GMT) intervals or about 15-20 nautical miles along the survey track. From these data, the magnetic elements -- declination, inclination, horizontal intensity, vertical intensity, and total intensity -- are determined and used in the compilation of the world isomagnetic charts published by this Office.

The survey is programmed to cover all ocean areas with equal priority. Tracks generally are oriented east-west and spaced 200 miles apart. Although flight altitudes vary from 4000 feet to 20,000 feet depending upon survey conditions, the majority of survey tracks are flown between 8000 and 10,000 feet altitude. Primary navigational control is provided by celestial fixes. However, doppler radar, radar, Loran-A, Loran-C, and visual sights are used whenever possible.

Geomagnetic data derived from Project MAGNET surveys are presented in tabular form along with time and space coordinates in Special Publication No. 66, "Airborne Geomagnetic Data 1953-1961," and in Special Publication No. 66 -- Supplement No. 1, "Airborne Geomagnetic Data 1962-1963." Approximately 43,000 data points are contained in these publications and about 37,000 more recent observations are available upon special request. Microfilm copies of the total intensity analog traces for the tracks listed in Section III-C are also available upon request.

III. PRODUCTS

A. Reports

Reprints of papers published in technical journals cannot be provided by the U. S. Naval Oceanographic Office. The following reports may be ordered from the Field Management and Dissemination Department, U. S. Naval Oceanographic Office, Washington, D. C. 20390:

(1) Technical Reports

TR-105, "Operation Deep Freeze 61, 1960-1961 Marine Geophysical Investigations," June 1962	No Charge
TR-118, "Operation Deep Freeze 62, 1961-1962 Marine Geophysical Investigations," February 1965	$1.25
TR-133, "A Marine Magnetic Survey Off the East Coast of the United States," September 1962	.40
TR-137, "A Marine Magnetic Survey South of the Hawaiian Islands," September 1962 (reprinted May 1965)	.85
TR-144, "A Study of Aeromagnetic Component Data -- Plantagenet Bank," G. A. Young and A. L. Kontis, January 1964	.30
TR-158, "A Marine Magnetic Survey of the New England Seamount Chain," James E. Walczak, October 1963	.40
TR-160, "Marine Magnetic Survey off the Southern Bahamas," Dewey R. Bracey and Otis E. Avery, July 1963	.40
TR-161, "Geomagnetic and Bathymetric Profiles Across the North Atlantic Ocean," Otis E. Avery, November 1963	1.35
TR-166, "A Study of Aeromagnetic Data -- New England Seamount Area," A. L. Kontis and G. A. Young, February 1965	.70
TR-168, "Marine Magnetic Surveys in the Northwest Pacific Ocean," Dewey R. Bracey, September 1963	.25

(2) Informal Reports

IMR M-1-63, "Preliminary Report on Special Aeromagnetic Survey -- Puerto Rico Trench, 1962," Wilburt H. Geddes and Leonard S. Dennis, May 1963

IR M-3-63, "Analysis of Approximating Residual Total Magnetic Intensity by the Projection of the Anomalous Force on the Earth's Normal Field," A. L. Kontis and C. A. Young, September 1963

IR M-4-63, "Marine Magnetic Profiles in the Pacific Ocean 1961-1962," Dewey R. Bracey, September 1963

IMR M-5-63, "Special Aeromagnetic Survey -- Mayaguez Area Puerto Rico," Leonard S. Dennis and Charles L. Gunn, Jr., June 1963

IR M-6-63, "Analysis of Puerto Rico Trench Marine Magnetic Survey Data," Gerald D. Van Voorhis and Jerry C. Carroll, September 1963

IMR M-7-63, "Geologic Interpretation of Marine Magnetic Data in an Area Off the Southern Bahama Islands," Dewey R. Bracey, November 1963

IMR M-8-63, "Summary of Magnetization Computations for Kelvin Seamount," Gerald Van Voorhis and James Walczak, January 1964

IMR M-9-63, "A Marine Magnetic Survey of an Area in the Central Indian Ocean," Gordon D. Burton, January 1964

IR M-10-63, "An Interpretation of an Aeromagnetic and Gravity Survey of Eastern Virginia," N. J. DiPiazza, December 1963

IR M-2-64, "A Deep-towed Magnetometer System," J. C. Carroll and J. E. Walczak, June 1964

IR H-1-65, " Geomagnetic Survey Northeast of Hispaniola," Gordon D. Burton, 1965

IR H-3-65, "An Airborne Geomagnetic Survey of the Reykjanes Ridge 1963," J. G. Baron, J. R. Heirtzler, and G. R. Lorentzen, 1965

IR H-4-65, "Proton Magnetometer Test On Board a Survey Aircraft," O. E. Avery and F. N. Waits, 1965

IR H-5-65, "An Airborne Geomagnetic Investigation of a Reported Declination Anomaly in Eastern Panama," J. G. Baron and G. R. Lorentzen, 1965

IR H-1-66, "Magnetic Anomalies North of Puerto Rico: Trend Removal with Orthogonal Polynomials," Gerald D. Van Voorhis and Thomas M. Davis, 1966

IR H-2-66, "Geophysical Profiles in the Northeastern Atlantic Ocean and the Mediterranean Sea, 1962-1963," D. E. Frankowski, 1966.

IR H-3-66, "Geomagnetic Measurements in the North Pacific Ocean Aboard USS REHOBOTH (AGS 50), 1961," R. F. Obrochta, 1966.

IR H-4-66, "Geomagnetic Measurements in the Pacific Ocean Aboard USNS CHARLES H. DAVIS (AGOR 5), 1964," D. R. Bracey, 1966.

IR H-5-66, "Shipboard Magnetic Survey of an Area North of the Lesser Antilles," O. E. Avery, J. C. Carroll, D. R. Bracey, 1966.

IR H-6-66, "Shipboard Magnetic Survey of an Area Northwest of Bermuda," Herbert K. Schneider, 1966.

IR 67-33, "ALUMINAUT Magnetometer Operations, St. Croix, Virgin Islands, 1966," Robert H. Higgs and Jerry C. Carroll, March 1967

IR 67-38, "Project MAGNET and Cosmic Rays," Leonard S. Dennis, May 1967.

IR 67-48, "Blake Ridge Aeromagnetic Survey," Dewey R. Bracey, June 1967.

IR 67-89, "Aeromagnetic Survey of Tampico Bank," Leonard S. Dennis and Patrick L. Taylor, December 1967.

IR 69-68, "Geomagnetic Profiles, Gibraltar to New York 1963-1964," Marine Branch, Magnetics Division, October 1969.

(3) Other Reports and Publications

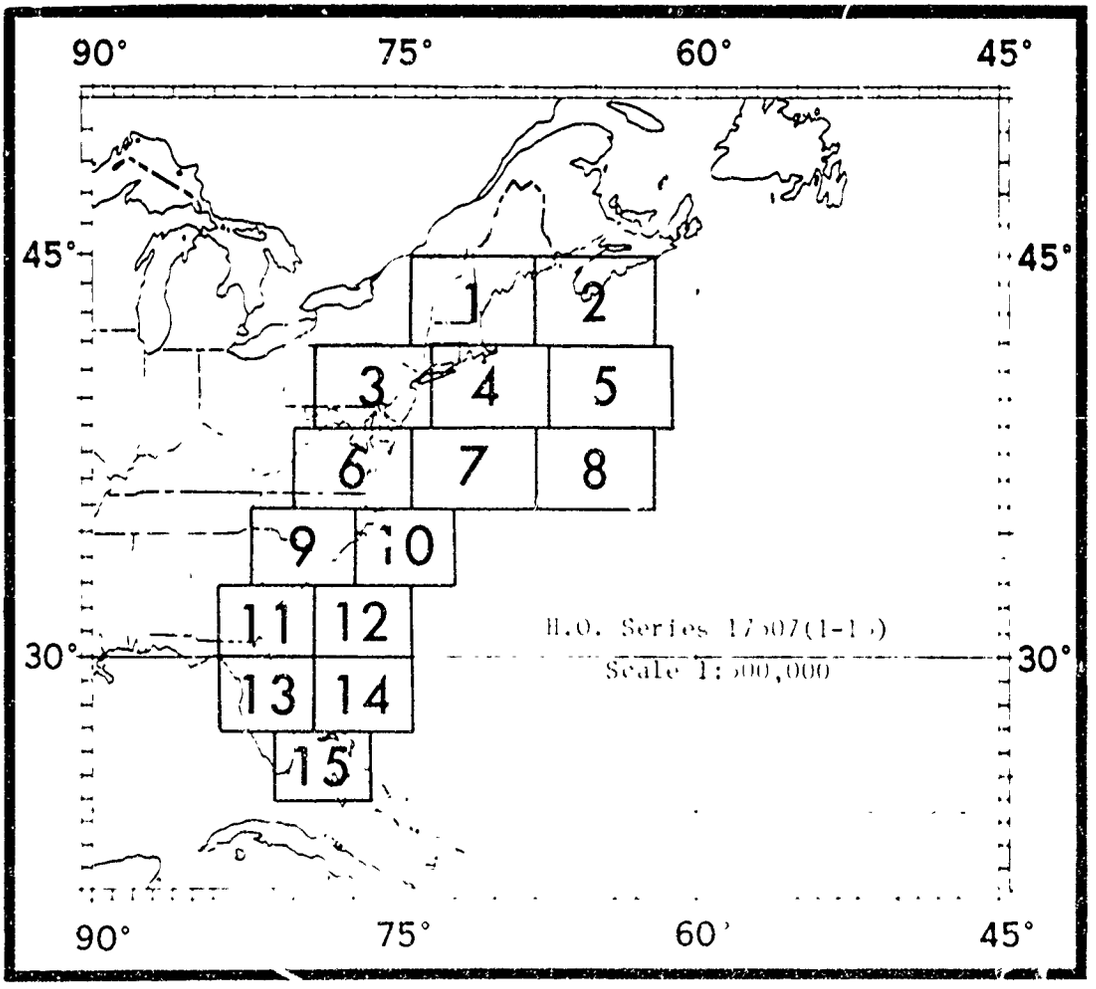
Special Pub. 66, "Airborne Geomagnetic Data, 1953-1961," 1963	$6.50
Special Pub. 66 Supplement No. 1, "Airborne Geomagnetic Data, 1962-1963," 1965	2.00
"Aeromagnetic Survey of the Gulf of Fonseca," Norbert J. O'Neill, 1965	No Charge
"Shipboard Magnetic Measurements in the Southwest Pacific Ocean, 1963-1965," (Preliminary report on USNS SGT SHOUP operations), Magnetics Division, 1966	No Charge
Special Pub. 120, "Chase VI Search Operations," (Report on search for the ROBERT LOUIS STEVENSON).	No Charge

B. Charts

(1) Epoch 1965.0 World Magnetic Charts: These charts of the magnetic elements were compiled using spherical harmonic analysis techniques by the U. S. Coast and Geodetic Survey in consultation with the Royal Greenwich Observatory and in collaboration with the U. S. Naval Oceanographic Office. The world charts employ the Mercator projection, scale 1:39,000,000 at the Equator, and extend from 84°N to 70°S. The polar charts are printed on a polar stereographic projection, scale 1:10,000,000 at 71° and extend from 55° latitude to the poles. The U. S. Naval Oceanographic Office publishes the Magnetic Variation Charts every 5 years (1965, 1970, 1975, etc.) and all other magnetic charts every 10 years (1965, 1975, 1985, etc.). The charts are available at $1.00 each from the Distribution Control Department, U. S. Naval Oceanographic Office, Washington, D. C. 20390, or the Branch Oceanographic Offices.

Chart Title	H.O. Chart No. and Type	
Magnetic Inclination or Dip, Epoch 1965.0	1700	World
	1700N	North Polar
	1700S	South Polar
Magnetic Horizontal Intensity, Epoch 1965.0	1701	World
	1701N	North Polar
	1701S	South Polar
Magnetic Vertical Intensity, Epoch 1965.0	1702	World
	1702N	North Polar
	1702S	South Polar
Magnetic Total Intensity, Epoch 1965.0	1703	World
	1703N	North Polar
	1703S	South Polar
Magnetic Variation, Epoch 1970.0	1706	World
	1706N	North Polar
	1706S	South Polar
Magnetic Grid Variation, Epoch 1970.0	1706N-G	North Polar
	1706S-G	South Polar

(2) Aeromagnetic Charts of U. S. Atlantic Coastal Region (H.O. Series 17507 (1-15)). Total magnetic intensity contoured at 50 gammas. Charts may be purchased from the Field Management and Dissemination Department (Code 4420), U. S. Naval Oceanographic Office, Washington, D. C. 20390. Individual charts are $0.50 each; complete set of 15 charts is $7.50.



(3) Preliminary Special Magnetic Survey Charts. The following preliminary charts presenting data from special magnetic surveys are available on request from the Magnetics Division, U. S. Naval Oceanographic Office, Washington, D. C. 20390:

North Arabian Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1961

Midway Islands Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1963

Westmann Islands Total Magnetic Intensity Contour Charts, Aeromagnetic Surveys, 1964 and 1966

Skagerrak Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1958

St. Peter and St. Paul Rocks Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1963

Pensacola Gulf Coast Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1959

Guardian Bank Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1964

Milwaukee Bank Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1963

North Magnetic Pole Inclination Contour Chart, Aeromagnetic Survey, 1960

South Magnetic Pole Inclination Contour Chart, Aeromagnetic Survey, 1960

Central South Dakota Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1964

Viti Levu Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1964

Eastern Mediterranean Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1957

Western Mediterranean Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1958

Western Tyrrhenian Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1957

Norwegian Sea Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1958-1959

Gulf of San Miguel Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1966

Southern California Total Magnetic Intensity Contour Chart, Aeromagnetic Survey, 1961

Total Magnetic Intensity Chart of South Vietnam, 1967

East China Sea Residual Magnetic Intensity Profiles, 1968

Taiwan Strait Total Magnetic Intensity Chart, 1968

C. Microfilm

The data listed below are available on microfilm and can be ordered from the Field Management and Dissemination Department, U. S. Naval Oceanographic Office, Washington, D. C. 20390. With the exception of the U. S. Atlantic Coastal Region Survey and the Southwest Pacific Survey, a microfilmed tabulation of aircraft altitude and position for each five minutes of time is included with each profile.

Tabulations of navigation positions for all tracks of the U. S. Atlantic Coastal Region Survey and Southwest Pacific Survey are contained on separate microfilm reels designated Reel Numbers 27A and 58A, respectively. Correlation with the microfilmed total intensity data is made by date and time.

Analog data which have not been microfilmed can be inspected upon prior arrangement with the Director of the Magnetics Division. The original data recordings, however, cannot be released outside the U. S. Naval Oceanographic Office.

1. Microfilm Copies of Total Magnetic Intensity Analog Recordings from Special Surveys.

Microfilmed analog recordings available for certain surveys listed in Section II are as follows:

Eastern and Western Mediterranean Sea Aeromagnetic Survey
Page II-A-23, 24 Reel Numbers 10 through 12 ----- $18 per set

Norwegian Sea Aeromagnetic Survey
Page II-A-25 Reel Numbers 13 through 18 ----- $36 per set

U. S. Atlantic Coastal Region Aeromagnetic Survey
Page II-A-27 Reel Numbers 19 through 27 and 27A -------
$60 per set

Southwest Pacific Survey
Page II-B-17 Reel Numbers 39 through 58 and 58A -------
$126 per set

2. Microfilm Copies of Project MAGNET Total Magnetic Intensity Analog Recordings

Microfilmed total intensity analog recordings are available for the regular Project MAGNET tracks flown from April 1953 through August 1967. A microfilm index, which lists survey tracks for each microfilm reel, and a track location chart are presented on the following pages.

Microfilm reel of Project MAGNET total intensity data: $ 6.00 each

Complete set of 24 reels:
(Microfilm reels 1 through 9; 28 through 38; 59 through 62)
$144.00 set

MICROFILM REEL INDEX FOR PROJECT MAGNET TRACKS

Reel 1	Reel 1	Reel 2	Reel 2	Reel 3	Reel 4	Reel 4	Reel 5	Reel 5
P001	0003	0016	0061	0069	T006B	T106	T203	123
P002	0004	0017	0062	0070	T008	T107	T204	126
P003	0005	0018	0063	0071	T012	T108A	T205	140
P004	0006	0019	0064	0072	T013	T108B	T206	141
P005	0007	0020	0065	0073	T014	T109A	T207	201A
P006	0008	0021	0066	0074	T015	T109B	T208	201B
P007	0009	0022	0067	0075	T015D	T112	T209	201C
P008	0010	0023	0068	0076	T017A	T113	T210	203A
P009	0011	0024		0077	T020	T114	T211	203B
P010	0012	0025		0078	T024	T115*	T212	204A
P011	0013	0026		0079	T025	T116	T213	
P012	0014	0027		0080	T026	T201	T215	
P013	0015	0028		0081	T028	T202	T216	
P014		0029		0082	T030		T224A	
P015		0030		0083	T031		T224B	
P016		0031		0084	T032		T301	
P017		0032		0085	T033		302	
P018		0033		0086	T034		T307	
P019		0034		0087	T035		T400	
P020		0035		0088	T041		T401	
P021		0036		0089	T042		T405	
P022		0037		T001A	T043		T406	
P023		0038		T001B	T044		T407	
P024		0039		T003A	T045		T410	
P025		0040		T003B	T046		T412	
P026		0041		T005	T047A		T413	
P027		0042		T006A	T047B		T414	
P028		0043			T058		T415	
P029		0044			T060		T501	
P030		0045			T061		102	
P031		0046			T062		104A	
P032		0047			T063		104B	
P033		0048			T064A		105A	
P034		0049			T064B		105B	
P035		0050			T065		106	
P036		0051			T066		107	
P037		0052			T069		108	
P038		0053			T074		109	
P039		0054			T075		110	
P040		0055			T076		111A	
P041		0056			T101		111B	
P042		0057			T102		112	
P043		0058			T103		113	
0001		0059			T104		114	
0002		0060			T105		115	

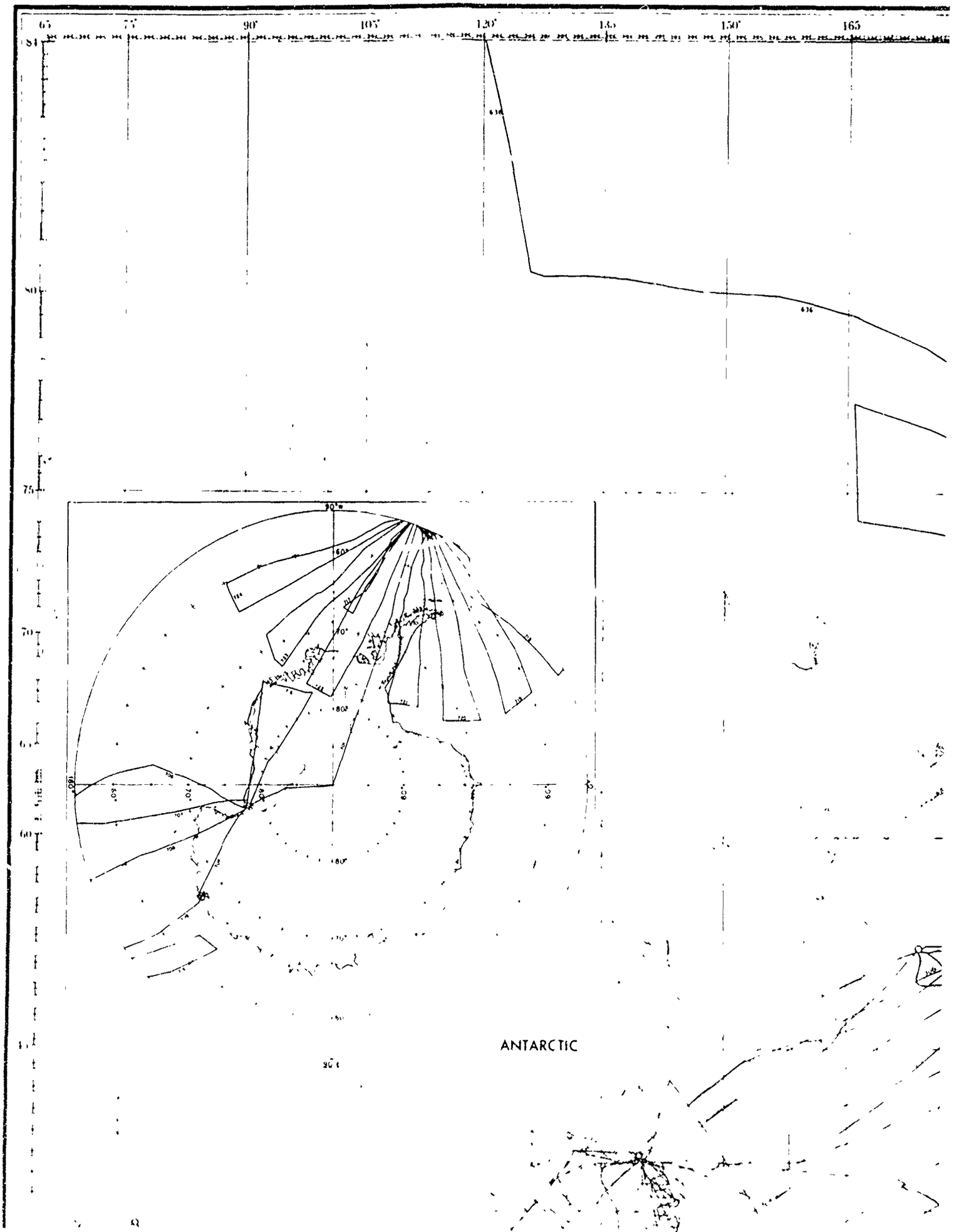
MICROFILM REEL INDEX FOR PROJECT MAGNET TRACKS

Reel 6	Reel 7	Reel 8	Reel 9	Reel 28	Reel 29	Reel 30	Reel 31	Reel 32
204B	343	437	604	103	202A	314	391	409
205A	344	440	606	129	202B	315	392A	427
205B	345	441	610A	129A	207	317	392B	429
206	345A	442	610B	149	208	305B	328	433
211	347	443	613	150	212	346	331	453
215	348	444	626	101A	213	351	332	454
217	349	445	627	127	219	363	333	403
218	350	447	633	128	226	366	335	406
301	353	449	634	142	227	368	337	410
302A	354	450	635	147B	228	371	339	412
302B	355	451A	636	148B	229	369	352	420
304	356	451B	637		209	372A	367	422
305A	357	452	638		210	372B	373	423
306	358	501	639		214	376**	384	424
307	359A	503	640		216	377	385	435
308	359B	505	701		221	383	386	438
308B	360	507	706		222A		388	439
308C	361	509	707		230		389	446
309	362A	510	708		231		390	458
310	362B	511	709		231A			459
311	364	512	715		232			460
312	375	512B	716					461
316	401	513	717					462
318	402	514B						463
320	404	515C						
321	405	516A						
322A	407	517						
322B	408	520						
323B	411	521						
324	415	523						
325A	416	526						
325B	421	527						
326	425	529						
327A	426	530						
329	428	531						
330	431	532						
334	432	533						
336	434	534						
338	436	537						
340		538						
341		540						
342		540A						
		543						
		544						
		603						

MICROFILM REEL LIST FOR PROJECT MAGNET TRACKS

Reel 33	Reel 34	Reel 35	Reel 36	Reel 37	Reel 38	Reel 59	Reel 60	Reel 61	Reel 62
502	718	812A	912	T-009	T-018	116	B-311	393	563A
506	719	812B	913	T-010	T-049	118	B-312	394	563B
524	720	814	915***	T-011	T-071	122	B-313	395	833
539	721	815	916***	T-016	T-073	131	B-314	396	834
541	722	836	917***	T-019	T-111	151	B-315	397	835
542	723	851		T-027	T-126	152	B-316	398	859
549	724	852		T-029	T-218	222	319	399	860
549A		853		T-077	T-219A	223	365	455	861
550		854		T-078	T-219B	224	374	456	862
551		855		T-079	T-220	225	378	457	864
552		856		T-110	T-225	237	379	504	901
516B		857		T-117	T-309	239	380	508	T-023
518		858		T-119	T-416	B-301	381	536	T-024B
519		813		T-124	T-417	B-302	382	553	T-048
522		838		T-125	T-502	B-303	387	554	T-120
525		850		T-222	T-504	B-304		555	T-121
528					T-505	B-305		556	T-122
535						B-306		561	T-123
545						B-309		562	T-137
546						B-310			T-217
547									T-303
548									T-304
									T-305
									T-310
									T-311
									T-402
									T-411

*Panama Survey
**Milwaukee Bank Survey
***Gulf of San Miguel Survey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90
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70
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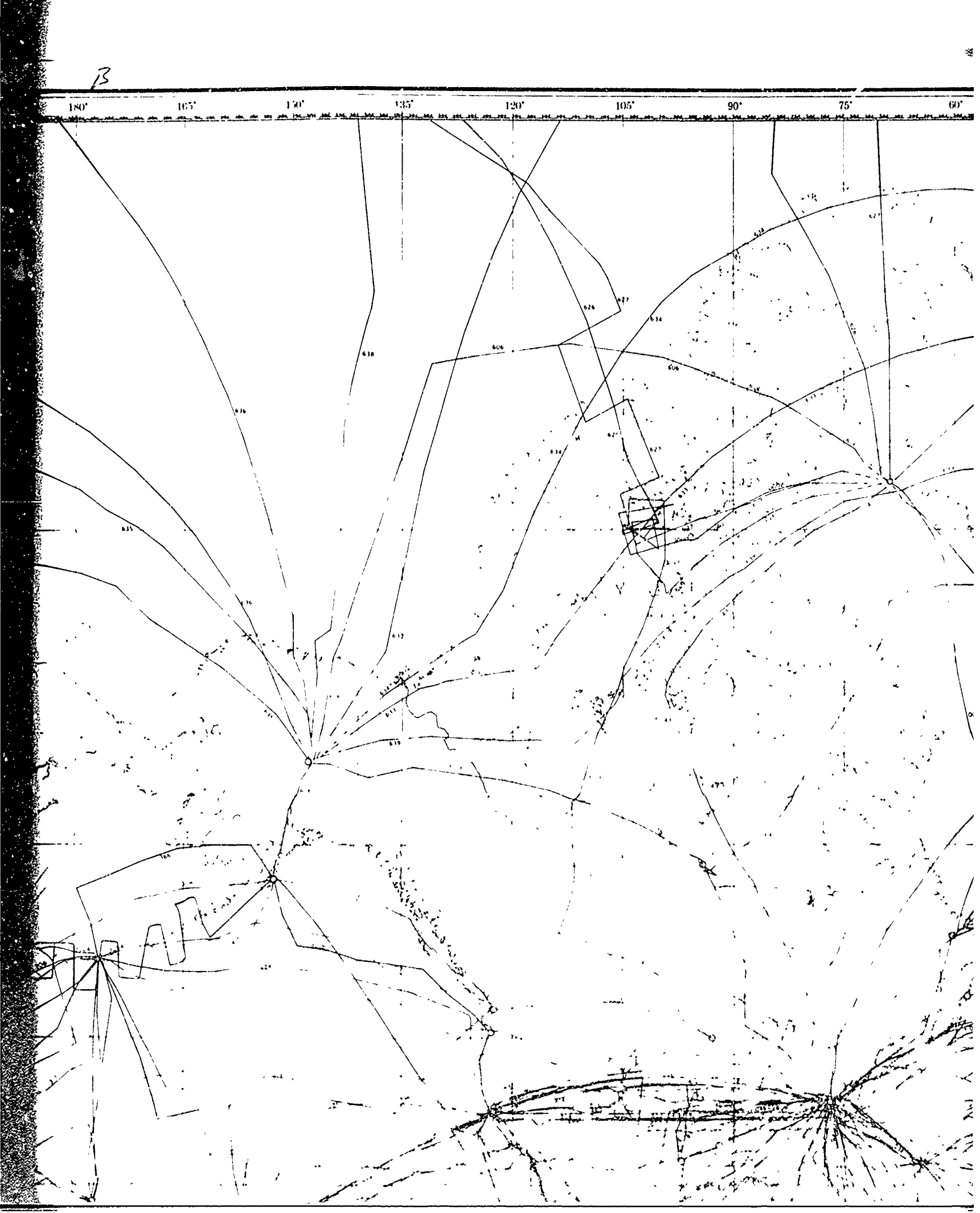
60
55
90°
60°
70°
80°
180°
ANTARCTIC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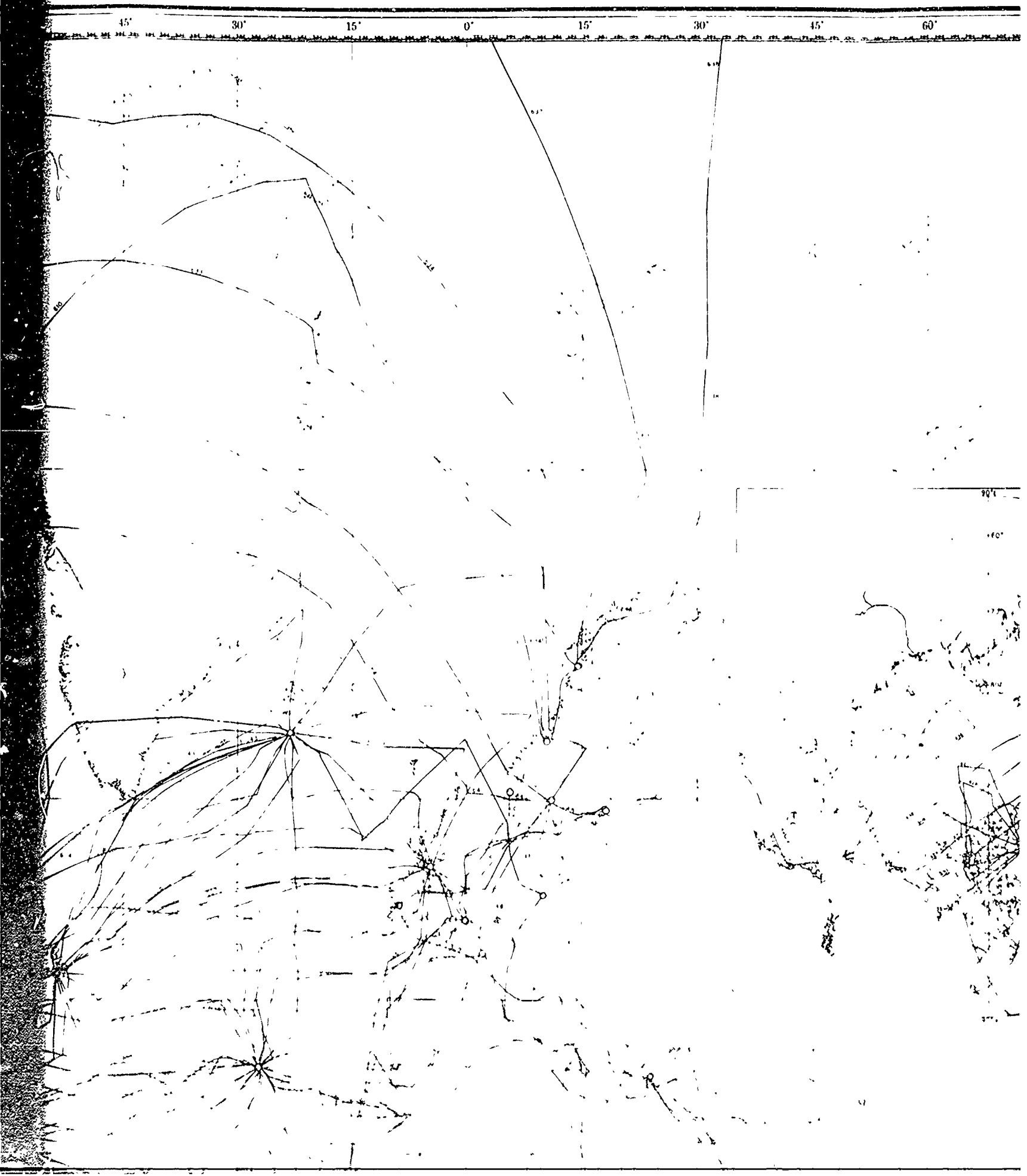
135°
120°
105°
90°
75°
60°

C



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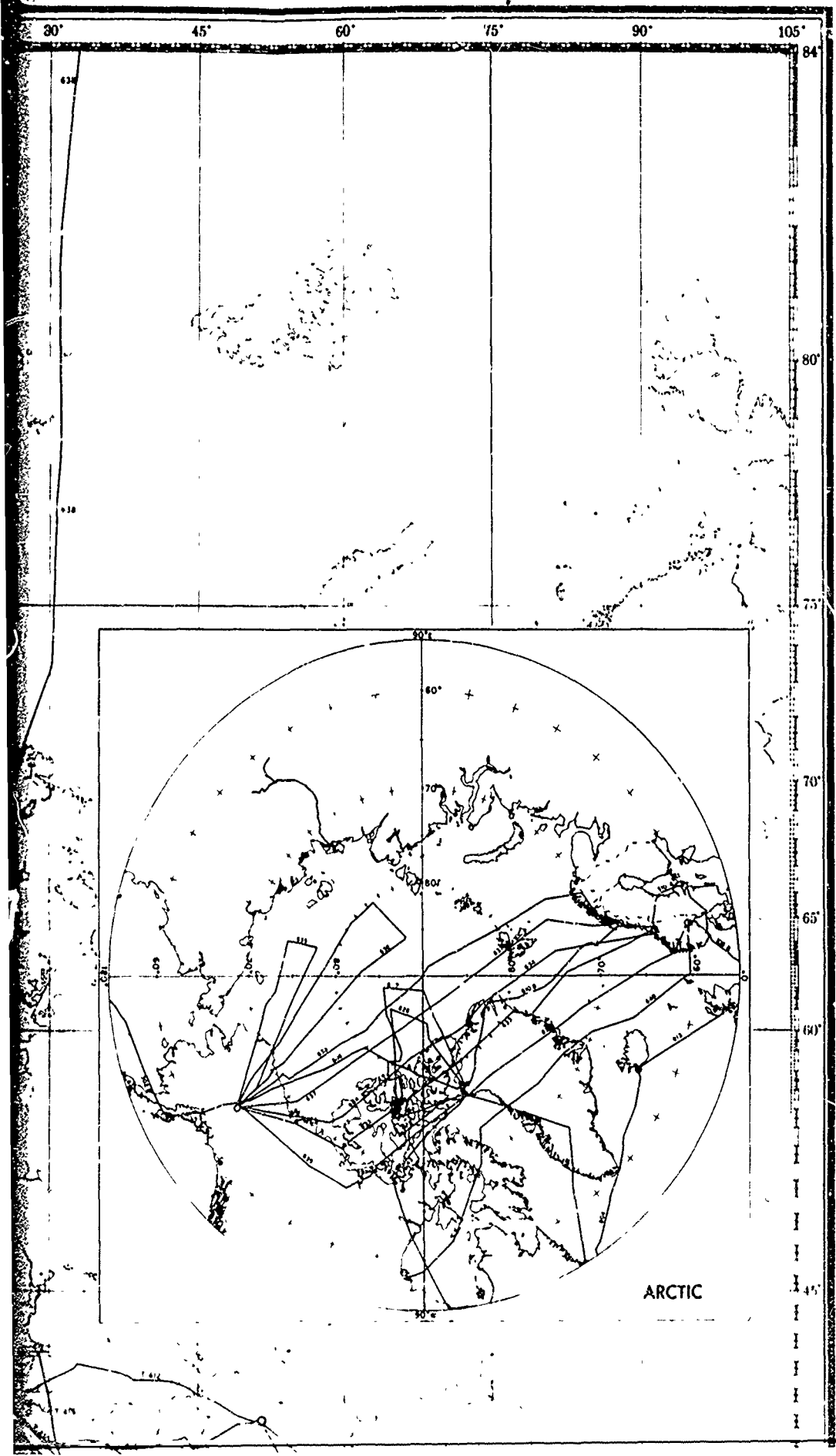

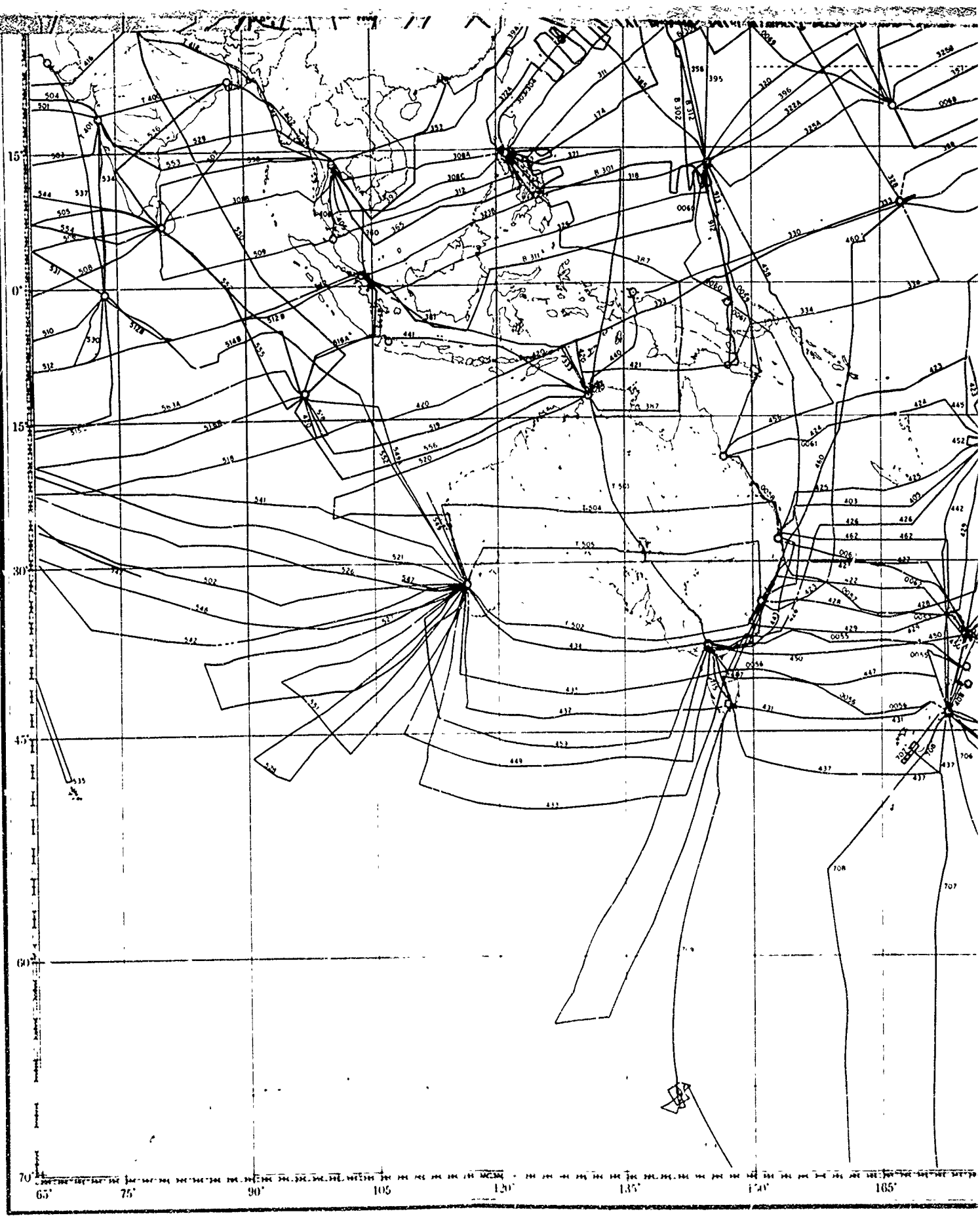
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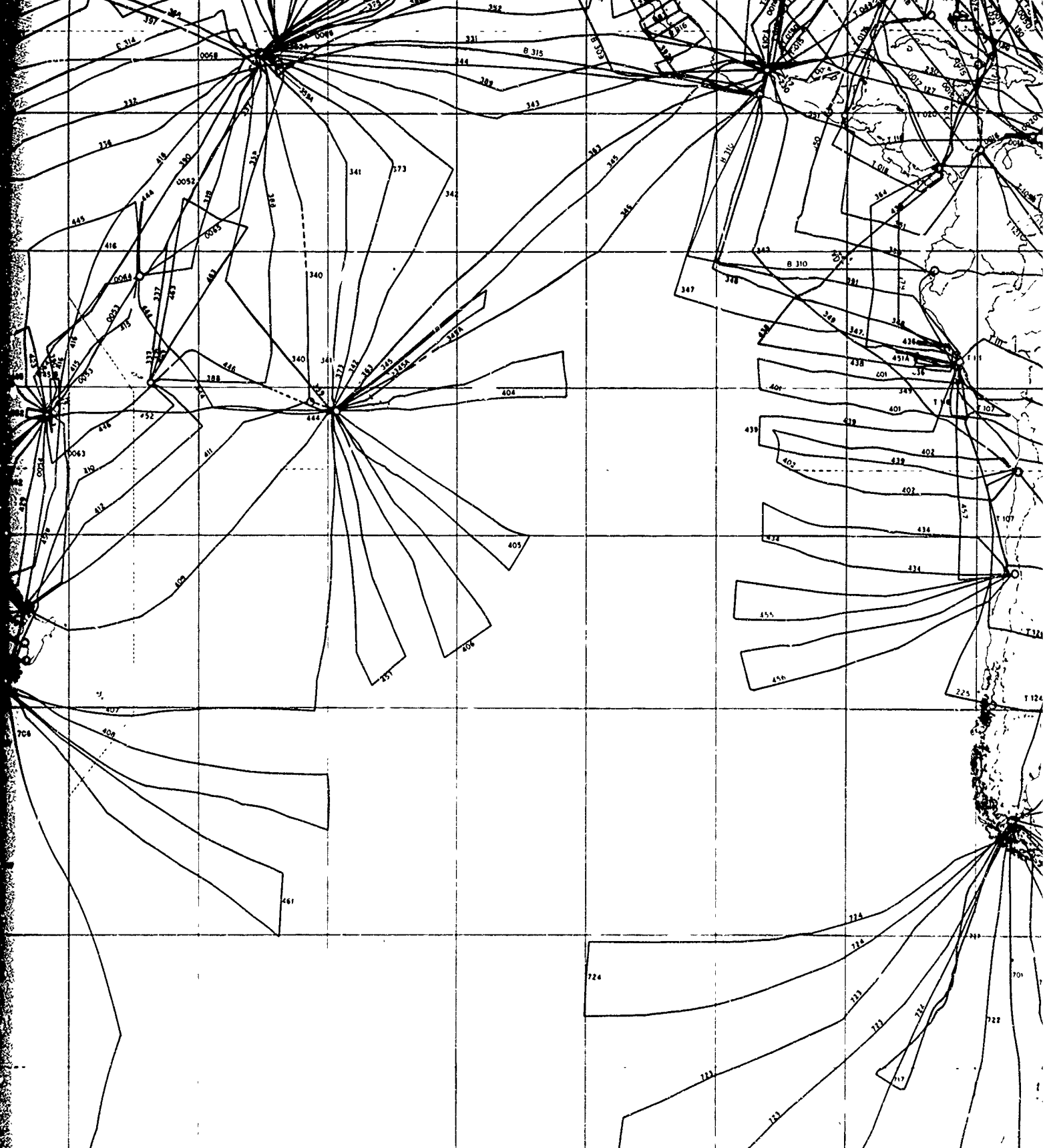
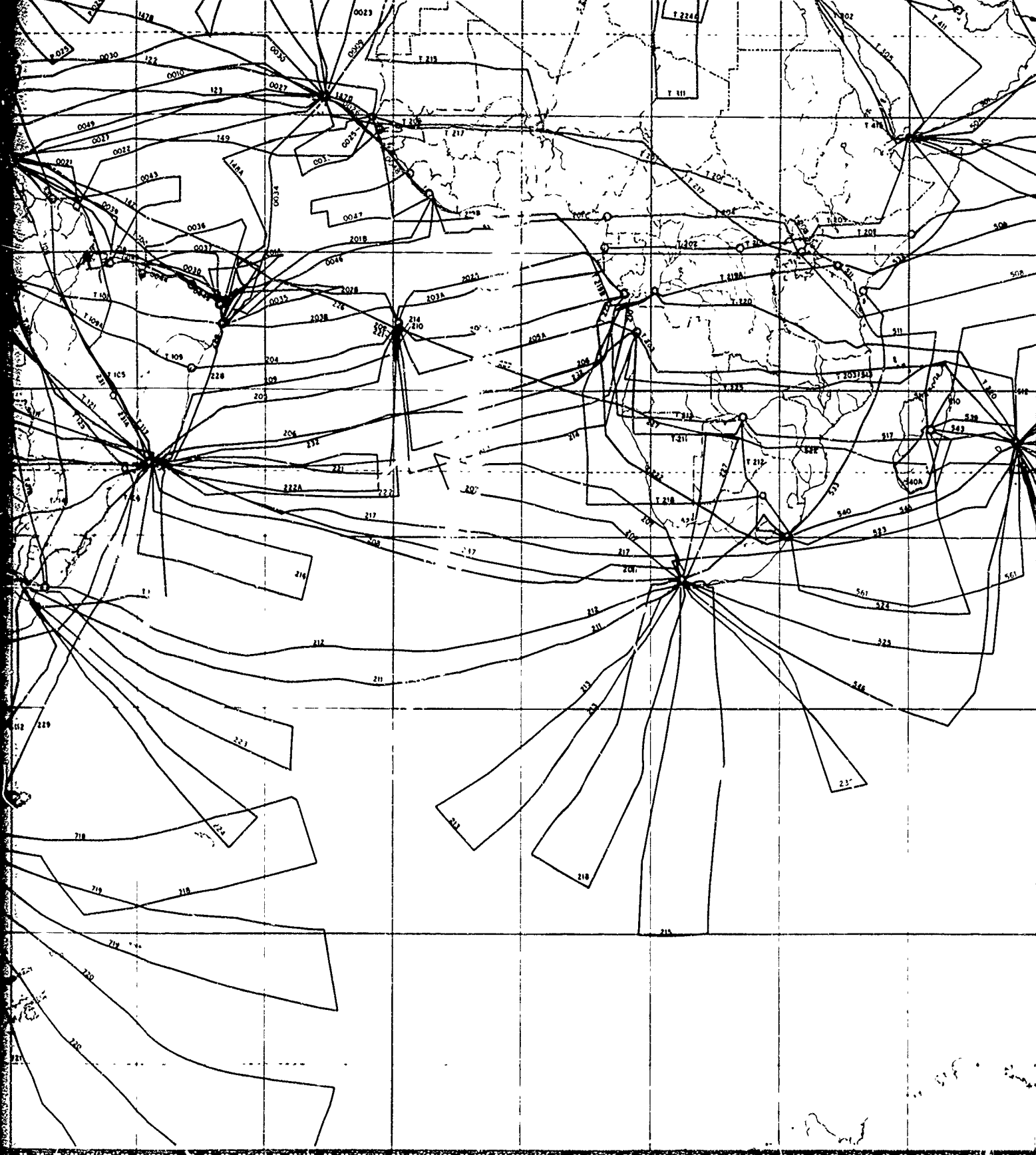


U.S. NAVAL OCEANOGRAPHIC OFFICE

PROJECT MAGNET TRACK LOCATION CHA

APRIL 1963 – AUGUST 1963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15'
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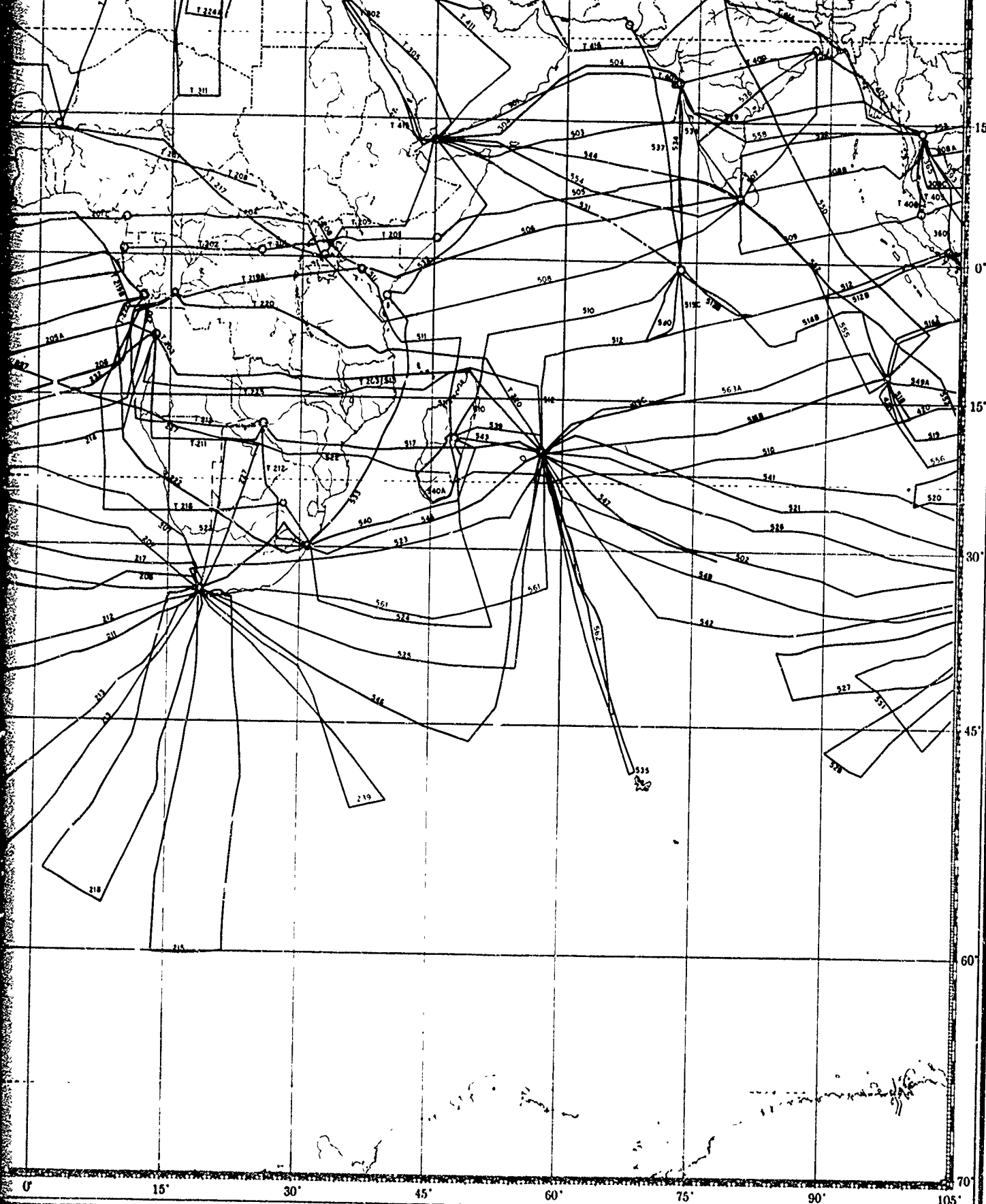
15'
30'
45'


15°
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